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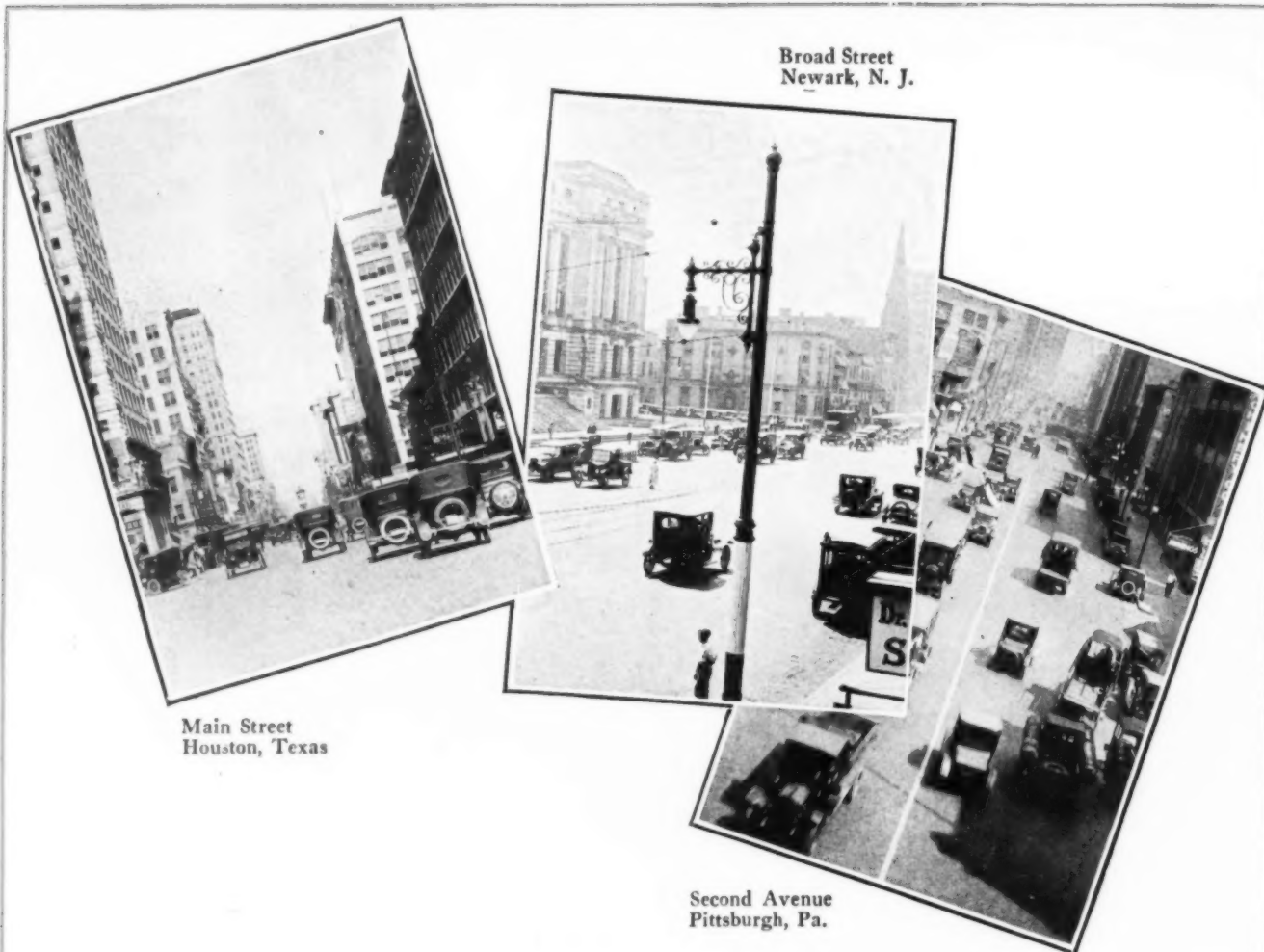
Construction Methods

McGraw-Hill Publishing Company, Inc., New York, N. Y.



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Successful
Construction
Methods

Hitting the High Spots

BEFORE you start reading this issue of *Successful Construction Methods*, throw another log on the fire and pull your chair up close to the hearth. If you don't, you will regret it, for we have put a lot of snow and ice into the pages that follow. Winter construction



work is increasing with such rapid strides that if we wanted to we could have given you a magazine filled from cover to cover with winter jobs. We decided, however, that such a procedure would be a little too chilly, so we included some warm weather articles to keep the temperature a little more comfortable.

IF YOU looked at the cover, and we hope that you did because it was put there to be looked at, and possibly admired, you had a glimpse at one of our winter articles. It describes the moving of a big apartment house in Albany, N. Y., to make room for the new State Office Building, and as you will find if you read the article on pages 15-18, it has been a winter job from start to finish. When the first snow fell, one of the voluntary superintendents who line up along the curb every day to watch the work, suggested to the contractors that rollers be dispensed with and runners substituted, which suggestion was summarily rejected even though it might have speeded up the job, and an apartment house out coasting would have been a most fascinating sight.



Continuing our icy way, we have provided four or five more articles that help to prove that the modern contractor doesn't know enough to go in the house when it freezes. There is a hilltop church job in Wisconsin (pages 22 and 23); a very, very cold diving job under the ice in Lake Erie (pages 32 and 33), and a hydro-electric job in Michigan (pages 34 and 35) and a couple of others.

THEN there is the first description that has been published of the snow experimental station that the Michigan Highway Department has established in order to make a scientific study of the drifting of snow. You will find it on pages 13 and 14. We had to walk around on snowshoes in a biting wind in order to get the material and pictures for that article, so we hope that you not only read it, but like it. Michigan is



doing a job that will be of help to every one of the states in the northern half of the country.

The warmer pages of the magazine contain some interesting concrete pipe construction work in Dayton, Ohio (pages 6-8); a description of an exceedingly speedy power house job down in Florida (pages 24-26), step-by-step directions for putting a belt on a conveyor (pages 28-29), and progressive working details of New York's subway timbering (pages 36-39).

OUR Blue Book, which is reserved each month for outstanding work, takes you to Peru, the land of the Incas, and gives you a glimpse of the work of the Foundation Company in providing the ancient Inca cities of Cuzco and Arequipa with modern sanitation. Water supply and sewer systems are being built, and one of the most interesting things about the work is the fact that old Inca and Spanish colonial construction is being turned up as the work progresses. By the way, the pages of the Blue Book are wide open for jobs done by our readers. If you have a set of pictures of your job that you think are as good or better than those you have seen in the Blue Book, tell us so, and send them along. As we have said before, and never can say too often, the pages of *Successful Construction Methods* belong to its readers. "The readers be pleased" is our slogan.





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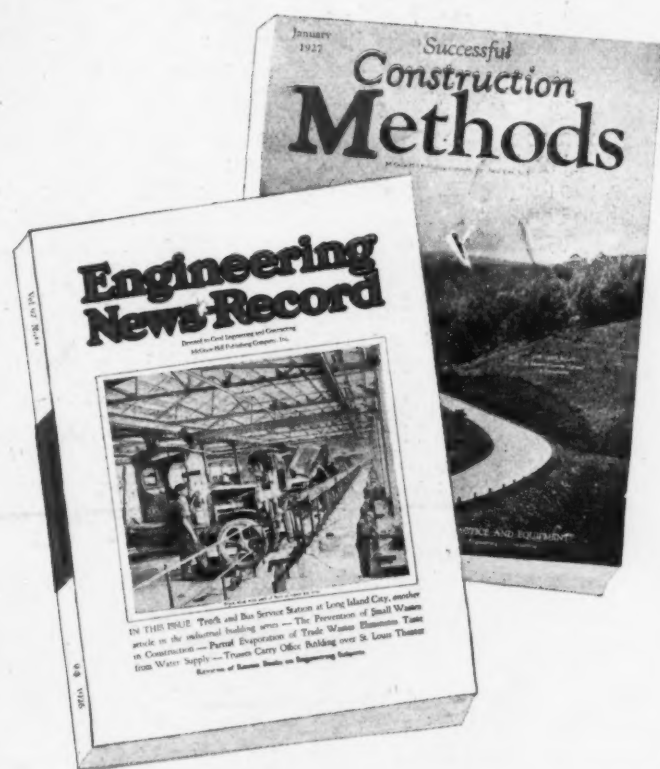
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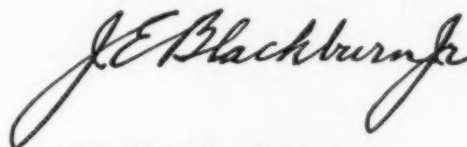
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Successful Construction Methods

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A Monthly Pictorial of Field Practice and Equipment

GENERAL CONSTRUCTION—HIGHWAYS—BUILDINGS
ENGINEERING—INDUSTRIAL

WILLIAM JABINE
Editor

VOLUME 9

NEW YORK, FEBRUARY, 1927

NUMBER 2

The New Swimming Hole



SO MANY pages of this issue of *Successful Construction Methods* are devoted to cold weather work that it may not be amiss to lead off with a few words about a job which bears with it an atmosphere of sunlit summer days.

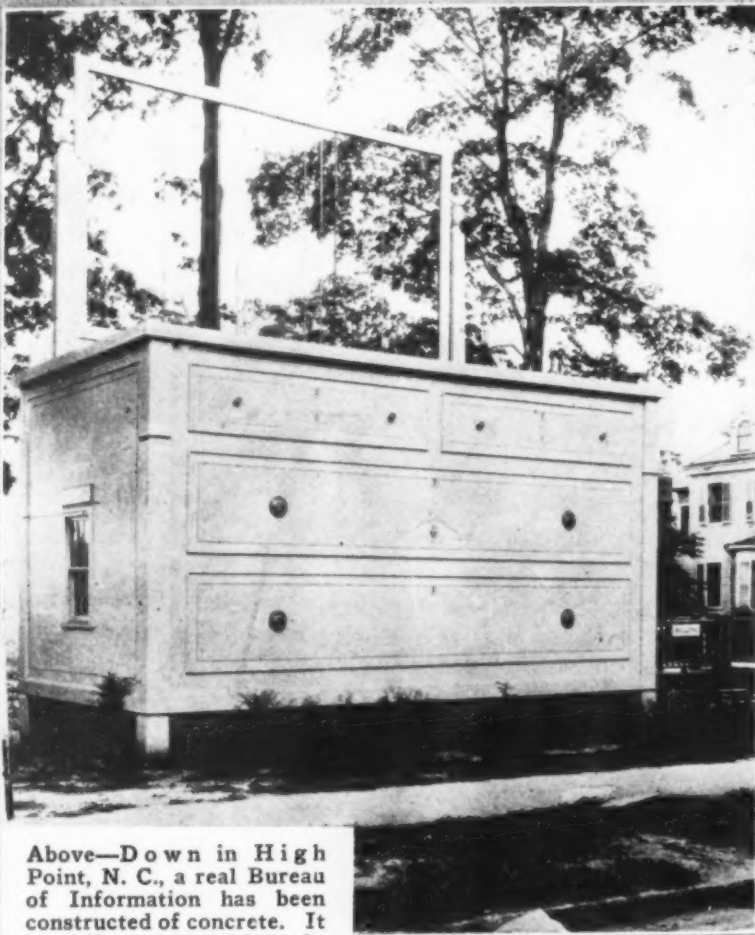
The photograph on this page shows a municipal swimming pool built for the Borough of Wyomissing, Pa. Although Wyomissing has a population of only 2,870, according to a 1926 census, it is providing its

citizens with facilities which are not often found in such small communities.

The pool is constructed of reinforced concrete and is 105 ft. long, 35 ft. wide, and from 4 to 9 ft. in depth. A bath house also was constructed by the Borough.

This photograph, which may help to lessen the chills produced by the snow and ice in so many of the photographs elsewhere in this issue, was sent to *Successful Construction Methods* by John Honker.

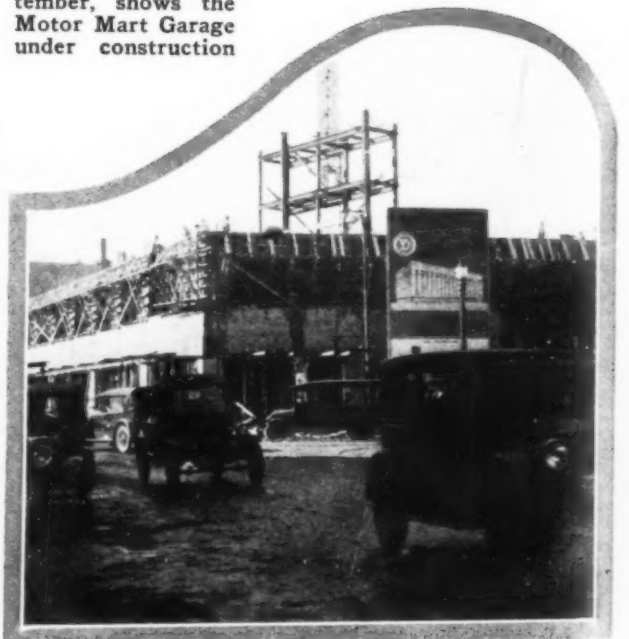
The Builder's



Above—Down in High Point, N. C., a real Bureau of Information has been constructed of concrete. It is 27 ft. square and 32 ft. high

© P. & A.

The photograph below, taken last September, shows the Motor Mart Garage under construction



Below—Boston's new Motor Mart Garage, just finished, has accommodations for 2,000 cars

© Herbert



's Work Is Never Done



Above—This house at Catonsville, Md., had to be razed and the occupants decided to live in it up to the last minute, which they did

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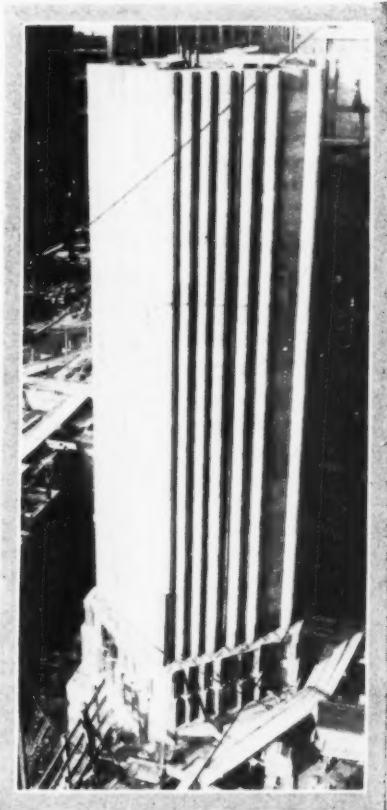
Below — In Middleboro, Ky., the Chamber of Commerce has advertised the local industry by building a house of coal for its headquarters

© P. & A.



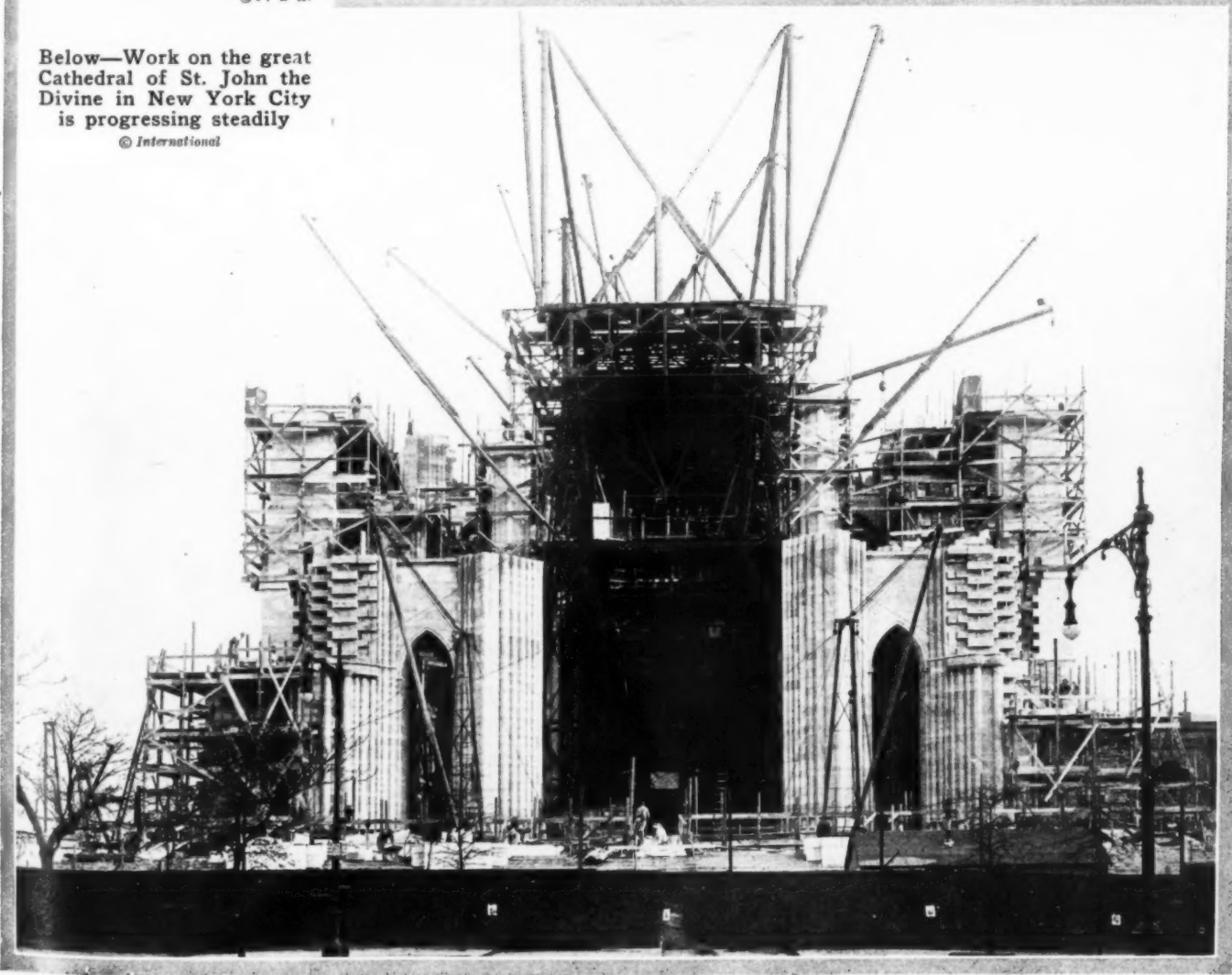
Right — One of the vestibule piers of the Cathedral of St. John the Divine

© Herbert.



Below—Work on the great Cathedral of St. John the Divine in New York City is progressing steadily

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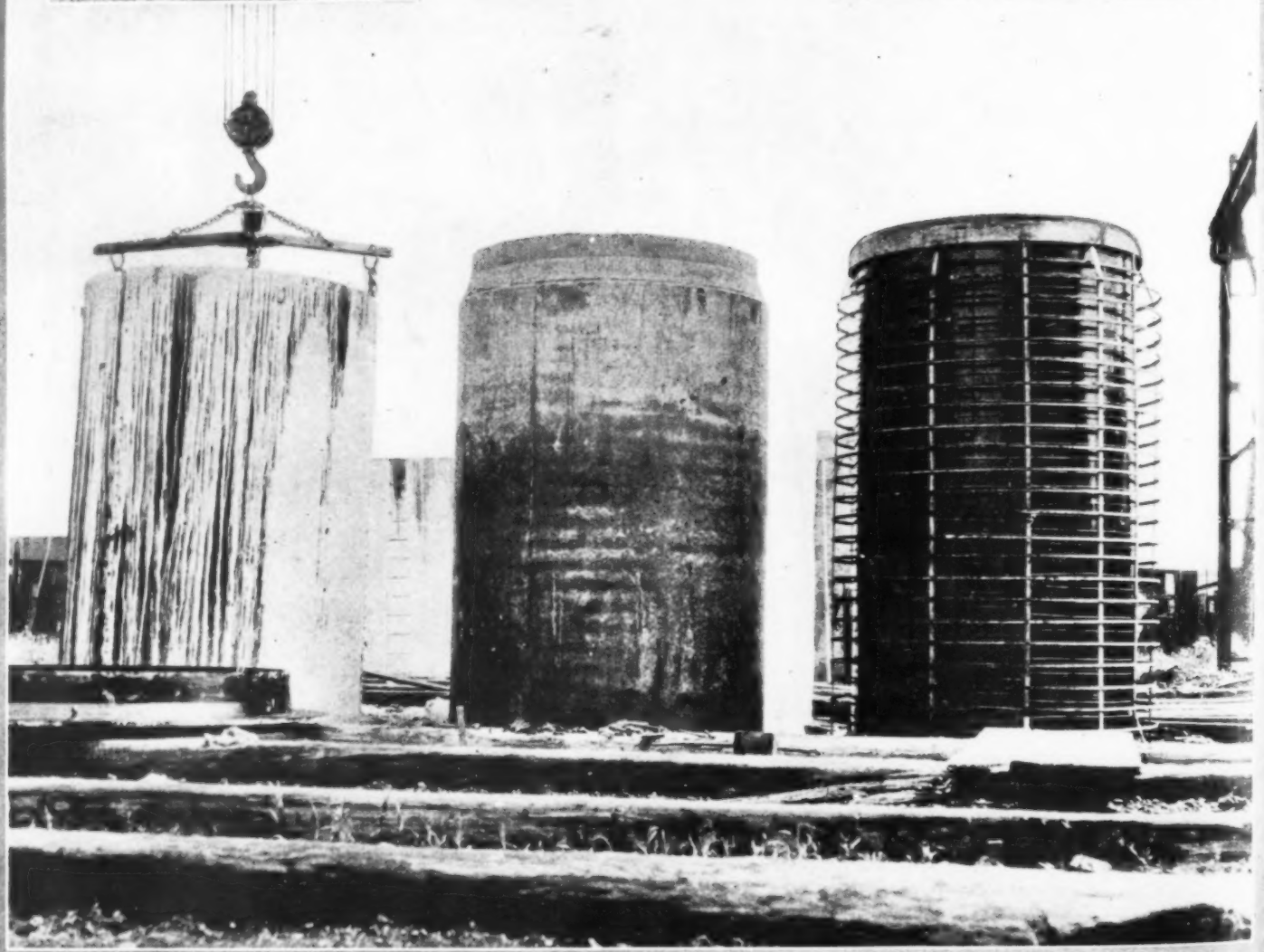
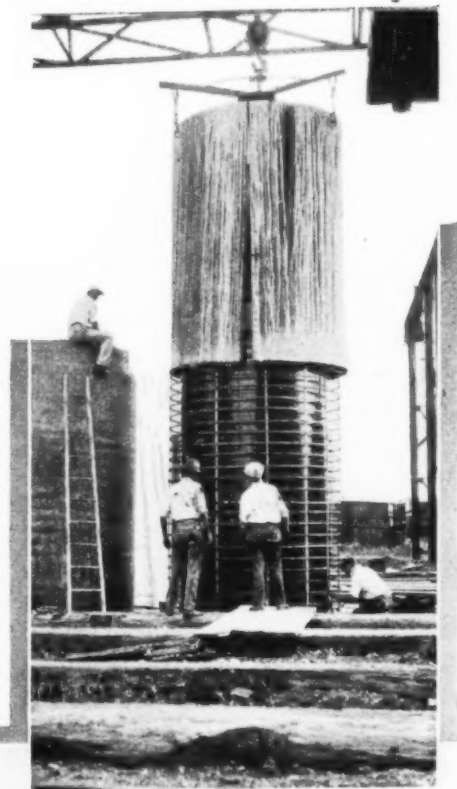


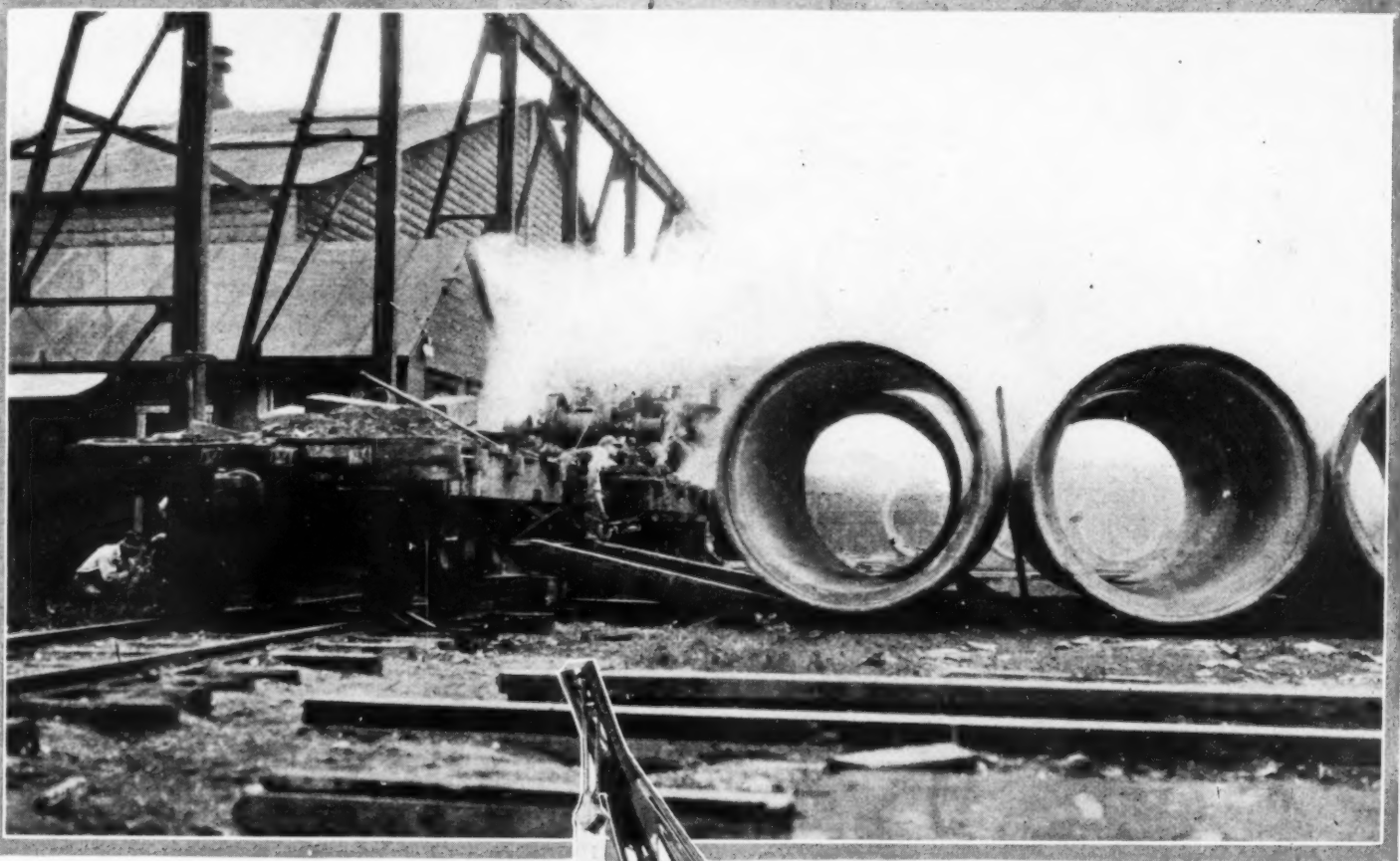
Big Pipe for Dayton

Concrete Conduit Built
by Water Department—
Precast Sections Taken
to Trench on Special
Cars



These three photographs show various stages in the casting of the concrete pipe. At the left the steel reinforcing is being placed over the inside form, and at the right the outside form is being lowered over the reinforcing. The picture below shows a section of completed pipe in the center, and at the right an inside form and reinforcing ready for the outside form which is shown at the left.

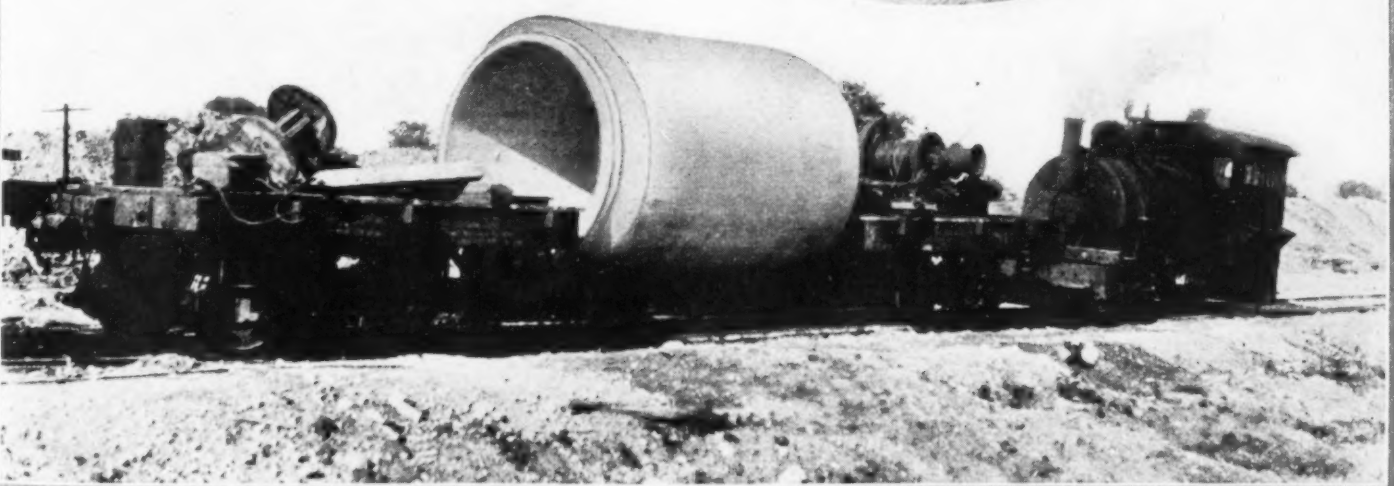
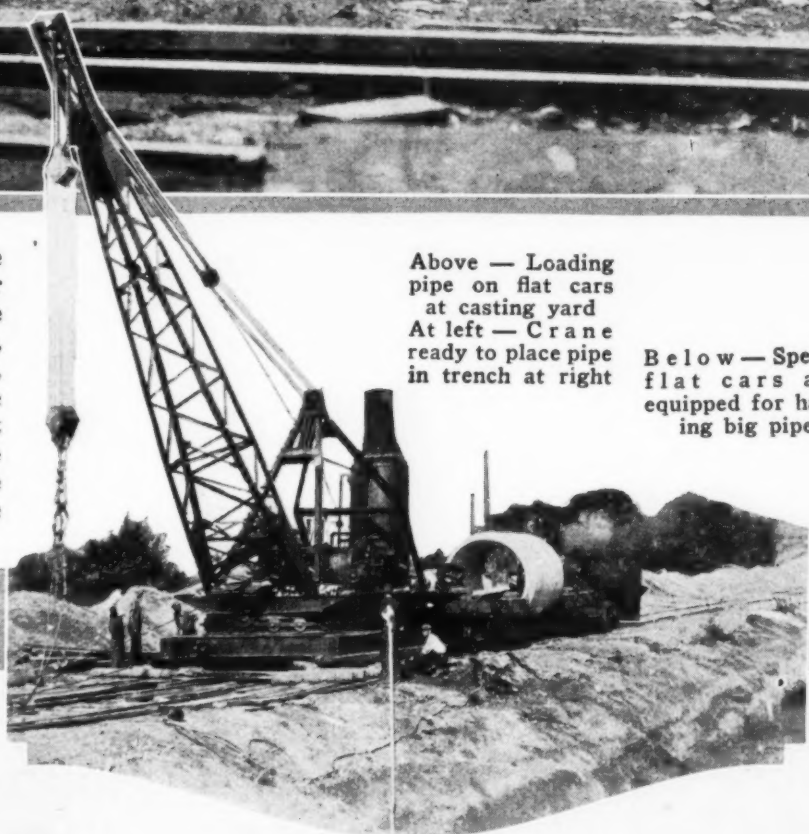




IN THE construction of a concrete pipe line 2½ miles in length which will convey water from wells to the main pumping station, the Water Department of the City of Dayton, Ohio, decided to use precast reinforced concrete pipe, 84 in. in diameter. The particular kind of pipe adopted is patented by I. D. Tramell of Fort Worth, Texas. The general contract for the construction of the conduit was let to Price Brothers of Dayton who also manufactured the pipe under the Tramell patent. The excavation and the actual laying of the pipe was handled by the Wiley Construction Com-

Above — Loading pipe on flat cars at casting yard
At left — Crane ready to place pipe in trench at right

Below — Special flat cars are equipped for hauling big pipe



pany of Dayton, and all of the work was carried on under the direction of W. W. Morehouse, General Superintendent, Division of Water of the City of Dayton, who sent the accompanying photographs to *Successful Construction Methods*.

The pipes were cast in 12½-ft. sections, in a yard situated on the line of the conduit and were then hauled to the place

cars, hauled to and placed in the trench. Tests made on samples of the concrete used showed a strength of 2,900 lb.

A completed section of the pipe ready for back-filling



Pouring concrete saddles in bottom of trench to support pipe



where they were needed on a standard gage railway. The pipes were cast vertically, bell end down, in steel forms fitting into machined cast iron castings forming the bell. Another casting was placed on top of the steel forms to form the spigot. The reinforcing was made of several different rolled shapes which were built up and electrically welded into a cage. This cage proved stiff enough to stand without the slightest sag.

The method used was to set the forms on end and pour the concrete. The following day the forms were removed and set up again ready for another pouring. On the fourth day the pipes were picked up by a traveling crane using a special sling and laid on their sides on timber skids. After the sixth day the pipes were in condition to be loaded on

in two days; 3,164 lb. in three days, and 3,684 lb. in seven days.

The trench for the conduit was dug by a Wiley Whirley which was moved forward on skids and rollers. This machine was equipped with a 1-yd. dragline bucket. The pipes were unloaded and placed in the trench by a second Whirley crane. A third machine of the same type handled the back-filler. The pipes are jointed by a poured lead joint. The pipes were laid in concrete saddles formed to fit the outside diameter of the pipe, two of these saddles being set in the trench for each 12½-ft. section of pipe. These saddles give a bearing area of one-half ton to a square foot with the pipe full of water. They were constructed in the trench and left half an inch low, the pipe being brought to grade by a cushion of dry cement and sand.

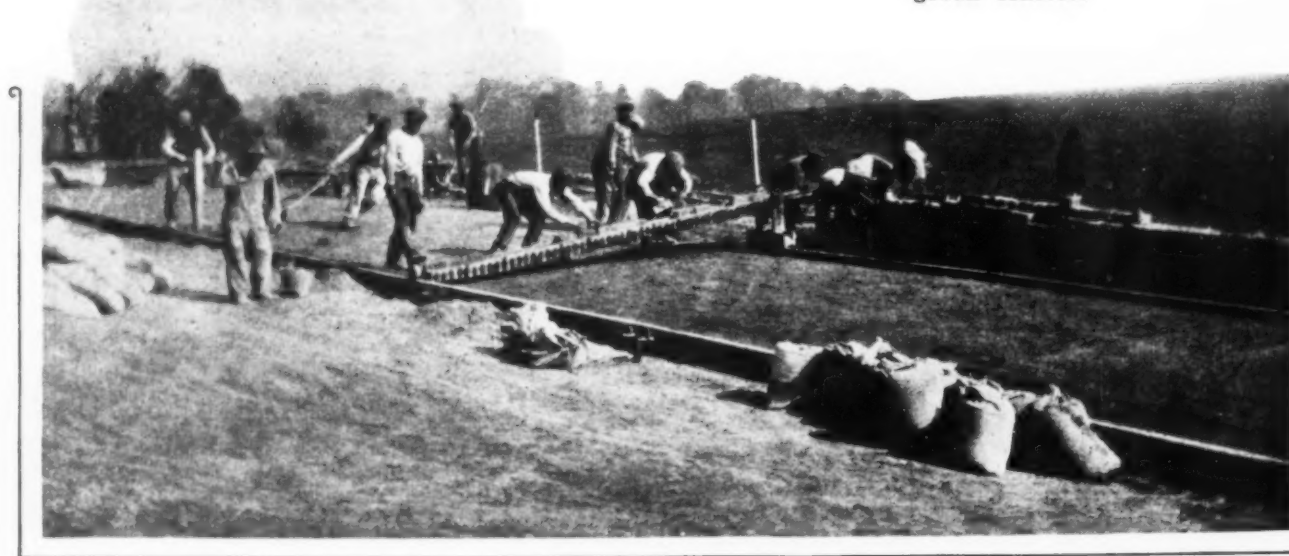
The photographs which accompany this article show practically every stage of the work from the pouring of the 12½-ft. sections in the casting yard to a section of finished pipe in place in the trench.

A Speedy Bricklaying Gang

THE accompanying photograph shows the bricklaying gang of the Wise Brothers Construction Co. of Canton, Ohio, laying brick on a highway job in Stark County, Ohio. The road, known as the Canton-Shepler Church Road, is 2½ miles long and 16 ft. wide with a 6-in. concrete base and superelevated curves. The road was built

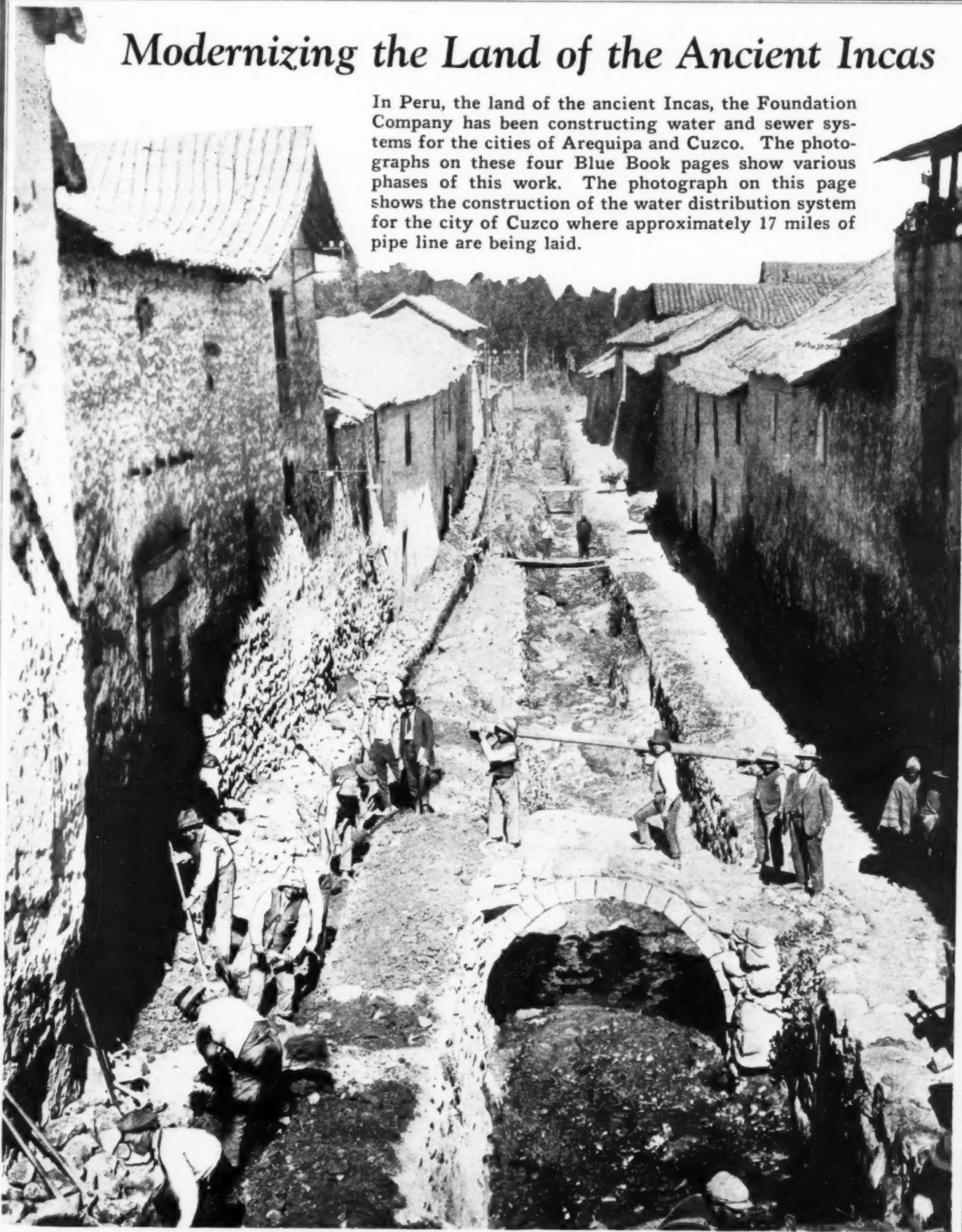
from start to finish in 21 working days. Materials were brought to the Ransome 21-E mixer in trucks, each truck hauling four 21-cu.ft. batches. Three sacks of cement were used for each batch. The photograph was sent to *Successful Construction Methods* by Homer O. Wise, general superintendent of Wise Brothers.

Laying brick on green concrete



Modernizing the Land of the Ancient Incas

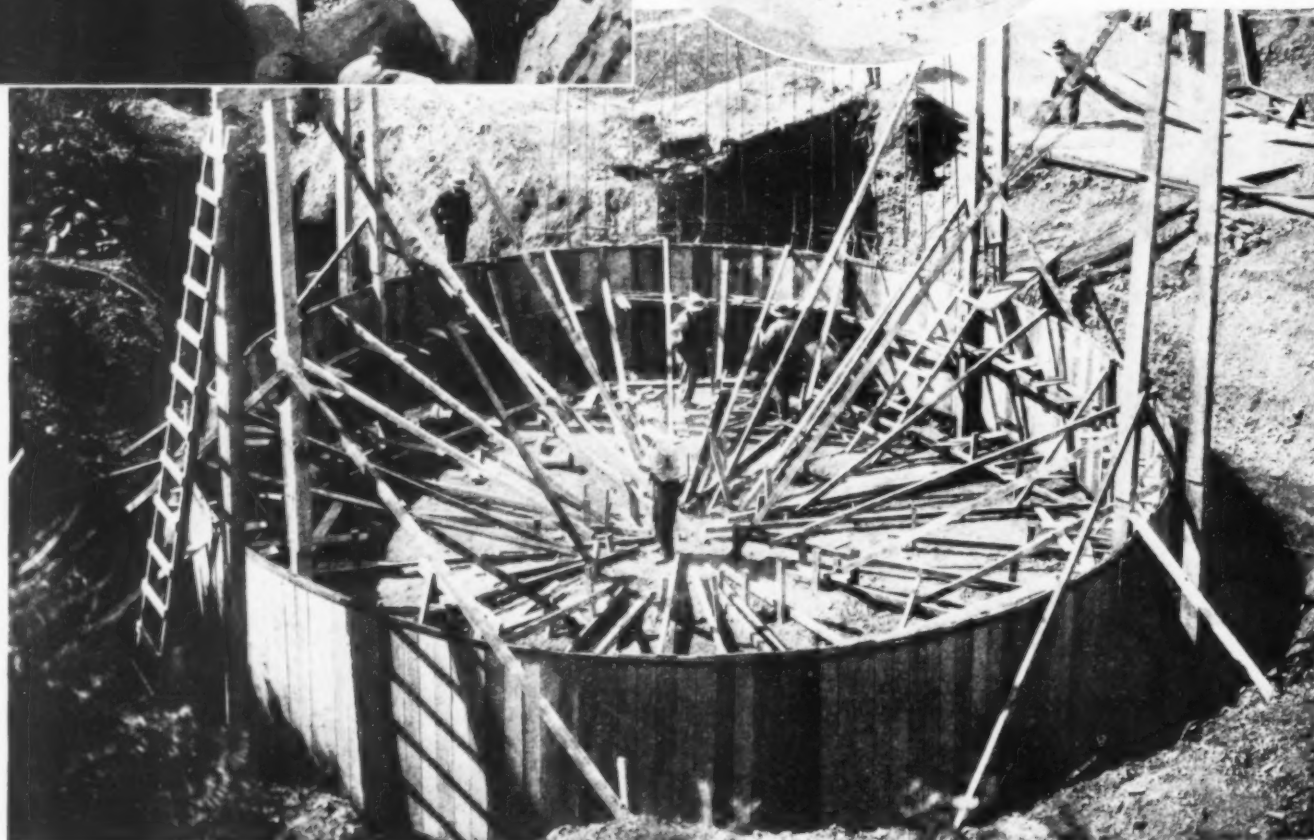
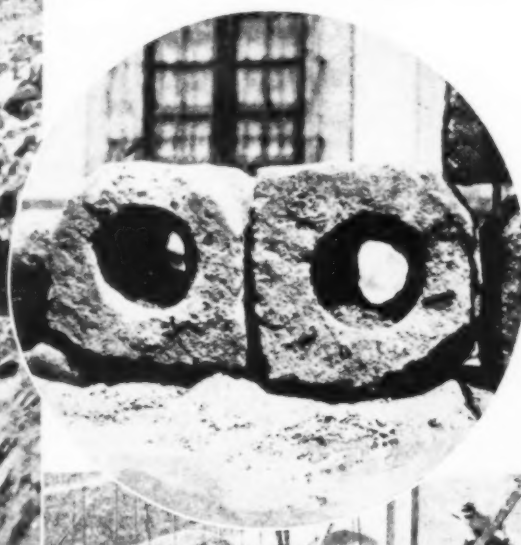
In Peru, the land of the ancient Incas, the Foundation Company has been constructing water and sewer systems for the cities of Arequipa and Cuzco. The photographs on these four Blue Book pages show various phases of this work. The photograph on this page shows the construction of the water distribution system for the city of Cuzco where approximately 17 miles of pipe line are being laid.





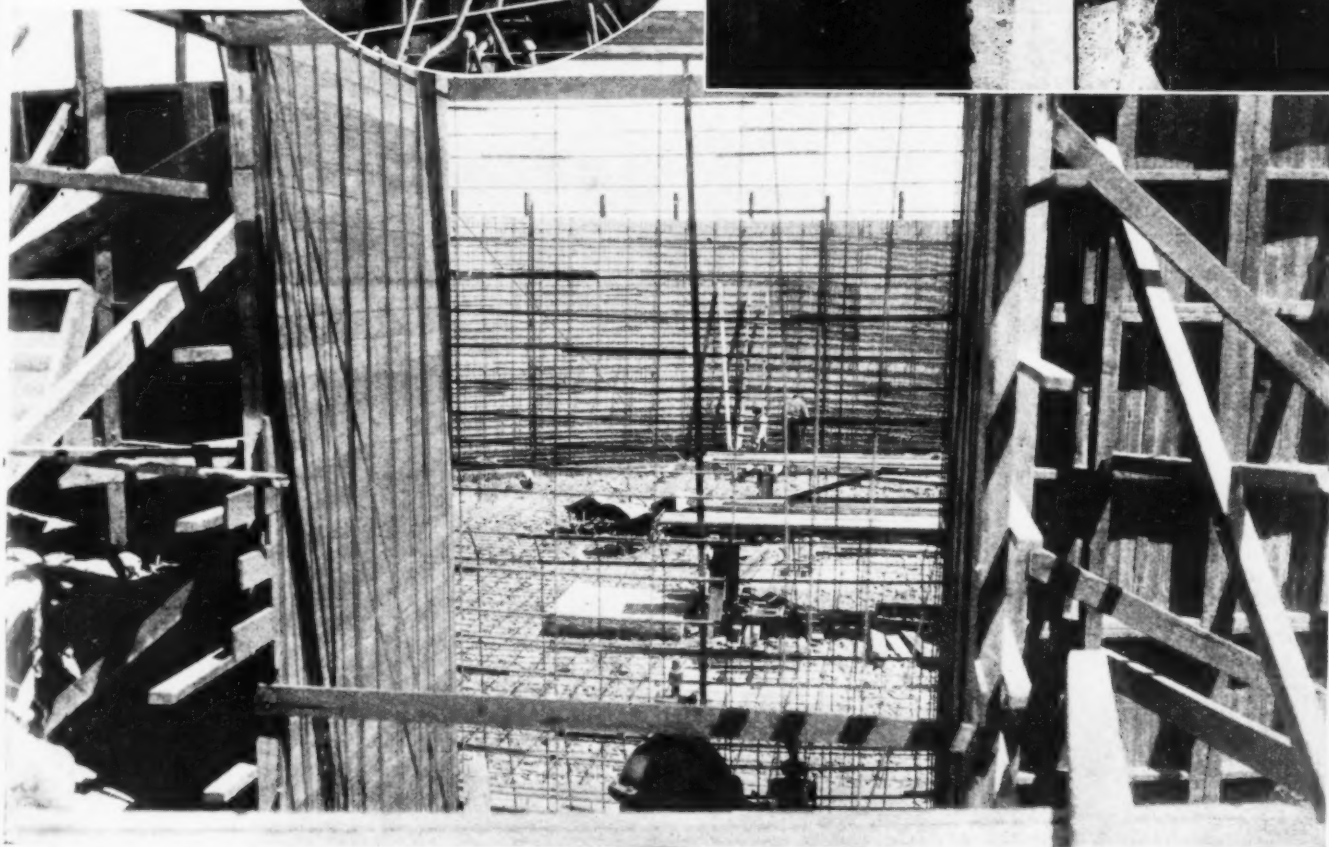
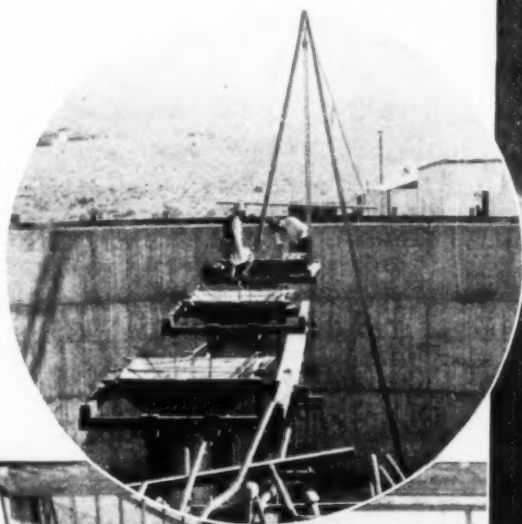
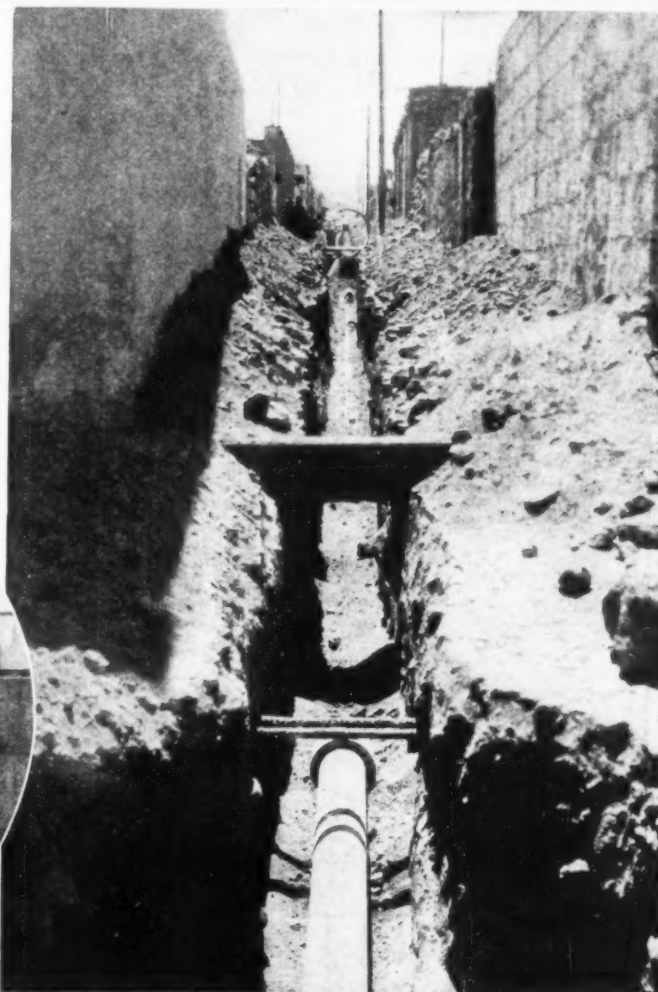
The Water System of Cuzco

is being designed to serve a population of 32,500, although the present population of the city is only 23,000. The photograph at the left shows the pipe line which is being laid for a distance of $3\frac{1}{2}$ miles from the springs at Korkor, the source of the water supply, to a reservoir outside of Cuzco. The center photograph shows a section of old pipe dug up from the remains of the ancient sanitary system. This pipe is of very light composition, of volcanic ash mixed with a few stones. The photograph at the bottom of the page shows one of the three new reservoirs being built just outside of Cuzco.



The Sewer System of Arequipa

is being pushed to completion by a force of 400 laborers. The photograph at the right shows the excavation being made in one of the streets. The pipe used is 6 in. to 21 in. in diameter. The center picture and the one at the bottom of the page show details of construction of Arequipa's water system. The center photograph shows workmen pouring the forms for the columns to be used in supporting the roof of one of the reservoirs. The lower photograph is a view of one of these reservoirs looking through the valve house at the inlet and gives a good idea of the reinforcing used in constructing the reservoir.

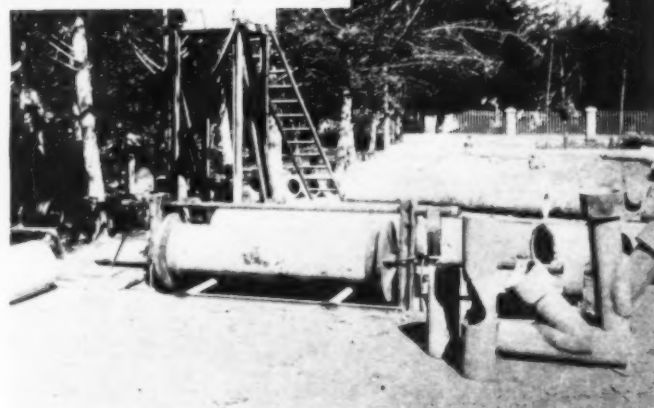


Cuzco Celebrates Completion of New Reservoir

The photograph at the right shows the dedication exercises at the completion of one of the Cuzco's new reservoirs. In the photograph below may be seen one of the old reservoirs which has been enlarged, the new portion nearly completed in the foreground



The photograph just below shows the testing machine at the Hume Pipe plant where all the pipe for the Arequipa water and sewer systems is made. The storage yard in the vicinity of the pipe line may be seen in the photograph at bottom of page



Michigan Studies Snow Drifts

Experimental Station at Alba Is First to Attack Problem

FOR the first time in all the years that snow has been covering the northern half of the United States, a scientific study is being made of the vagaries of drifting snow. The Michigan Highway Department has established at Alba, Michigan, a point where there is an average annual snowfall of about 90 in., an experimental station for the purpose of finding out all that can be discovered in regard to the action of snow.

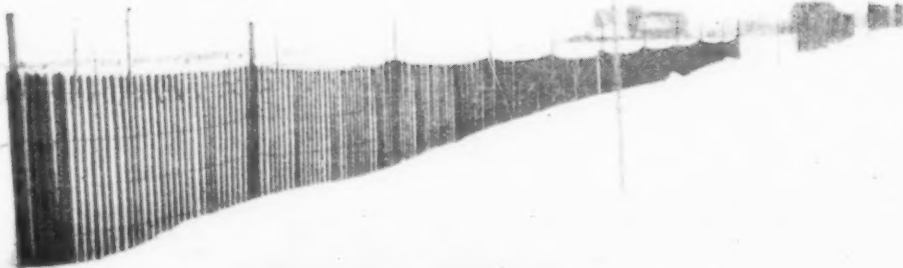
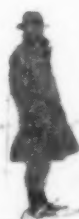
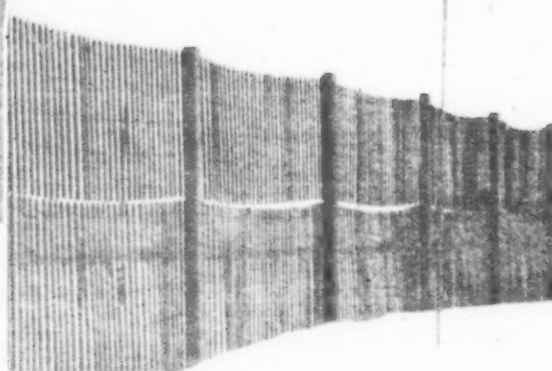
To V. R. Burton, engineer on special assignment, belongs the credit for the establishment of the snow station and he

is keeping in close touch with it by making frequent visits to Alba.

The station was opened about December 10, and two engineers from the Michigan Highway Department were put in charge. They live day and night in a small house built by the department. This house is equipped with most of the instruments used at the stations of the U. S. Weather Bureau, and one of the engineers in charge spent several weeks in the U. S. Weather Bureau office at Lansing before going to Alba. A wind gage, a thermograph, a wet and dry

The photographs on this page were taken on a typical day at the Alba snow station. The sky was overcast and a cold wind was blowing. V. R. Burton, who is responsible for the establishment of the station, is the man on snowshoes in three of the photographs

Mr. Burton and one of the engineers in charge of the snow station are shown inspecting some of the recording instruments. The three lower pictures show sections of the experimental fences and measuring stakes and give a good idea of how the snow is drifting



bulb psychrometer, a sunshine report recorder and a maximum solar radiation thermometer are among the instruments used to keep the daily records. In addition to this, measurements are made of the density of the snow, of the depth of drifts at various points, of shrinkage during the days after a storm and various other facts which will help in the work of finding out how snow acts.

The most conspicuous features of the landscape at the snow station are the experimental sections of snow fence which have been put up. Practically every type of snow fence is represented, some of the sections being 100 ft. in length and others 50 ft. The highest sections being studied are 10 ft. in height and the lowest are 4 ft. high. The arrangements of the pickets in the fences are being tested and everything possible is being done to determine just which type of snow fence will do the work best. Measuring stakes have been put up at various distances from the experimental fences and readings of these stakes are made every day in order to determine how the snow is drifting.

Since the station was established considerable snow has fallen, and the temperature on one occasion dropped as low as 30 degrees below zero. The maximum velocity reached by the wind thus far has been 60 miles an hour. Although the work has not been in progress long enough to make it possible to reach definite conclusions, it begins to look as

though the most effective fence is that with the narrow spaces between pickets. The sections at Alba with pickets $\frac{3}{4}$ in. apart seem to do the work much better than the others.

The depth of each snowfall is measured at a station situated in some woods about half a mile from the building where the two engineers live. The trees protect this measuring station from the wind and so reduce drifting to a minimum. The measurements are made at this point twice a day and provide the basic figure for the depth of each snowfall.

All that is needed is plenty of snow and wind. The snowfall was a little lighter than usual during December but the storms that came along early in January provided plenty of material for study.

The Michigan Highway Department, under the leadership of Frank F. Rogers, is so popular that it usually can get almost anything it wants in the state, but it has had no luck in regard to the direction of the wind at Alba. The experimental fences were set up on the theory that the prevailing winds were from the northwest, but so far they have come from the southeast. Nevertheless much valuable data is being collected and the station probably will be kept going for at least one more winter, if not longer. Michigan is doing a real service for the other snow states in collecting this information.

Simple Brake Device Used on Indiana Road Jobs



IN HANDLING trains of from 15 to 20 cars on a road job in Indiana Earl Hurst, superintendent for the Wabash Construction Company of Vincennes, Indiana, has been using a braking device which is shown in the photograph below. This consists of a 3-ft. piece of 3-in. channel iron bent on one end to a 30-degree angle to prevent it from catching on the rails. This is fastened to the car ahead by a length of chain. When the irons are placed on the track, the car wheels run on them and are effectively locked. Mr. Hurst says that by using this simple scheme for braking cars he has effected large savings. He has used this braking device with great success on a 20-mile stretch of road which his company completed recently.

Making Way for the State

New York Plans Office Building in Albany Near Capitol—
Big Apartment Moved to Clear Site

By J. W. Eichleay

THE State of New York recently purchased a plot of ground near the present State Capitol on which it intends to erect an \$8,000,000 office building. On this plot among a group of small dwellings stood an eight-story apartment building which was less than 10 years old and in excellent condition. Several real estate men of the city decided that it was too valuable to tear down, so they communicated with the John Eichleay, Jr., Co. of Pittsburgh, to find out whether it could be moved. The Ft. Frederick, as it is called, is 55 ft. by 70 ft. and 125 ft. high, and is of steel frame construction. The walls are brick and the floors reinforced concrete. The weight is 4,000 tons. After studying the situation the Eichleay organization undertook the job of moving the structure to a new site 400 ft. distant.

The method of doing the work is as follows: First of all, the partition walls in the basement were taken out and the concrete around the columns removed. Next, holes were drilled in the columns and steel brackets were riveted on to the columns. To these brackets were bolted 28-in. H beams running the length of the building. There were 8 rows of these 28-in. beams and 4 rows of columns. Each row had 2 lines of 28-in. beams to support them. Suitable cribbing was placed under these 28-in. beams and 5-ton screw jacks were placed on the cribbing and under the 28-in. beams. The jacks were then screwed tight and the load

on the footings was transferred to the 28-in. beams and from them to the cribbing. After all of the load of the building was thus transferred, the columns were sawed off underneath the brackets and the building was then resting on the temporary foundation. Next the building was raised 3 ft. so it would be high enough to clear State Street, an important thoroughfare, which it had to cross.

After the building was raised to the necessary height, 3-in. steel rollers were placed between the screws under the 28-in. beams. Rails were placed under the rollers and blocked up on the cribbing. The jacks were then released and the building was then resting on the rollers ready for its journey to the new location.

The ground over which the building had to travel was a soft blue clay. Planks were placed on the ground covering the width of the building and on these was placed a mat of 12 in. by 12 in. timbers on which the rails rested. The mat was so designed that there would be less than $\frac{1}{4}$ of a ton per square foot of soil.

Cables were then reaved up in two pairs of 6-sheave blocks. One block in each pair was fastened to the building and each of the other blocks fastened to dead men. The two lead lines were each attached to separate windlasses, and a team of horses hitched to each windlass furnished the motive power. The speed of the building was about 7 in. a

The Ft. Frederick apartment as it looked on its way to its new site. It was at the corner of State and Swan Streets when this picture was taken

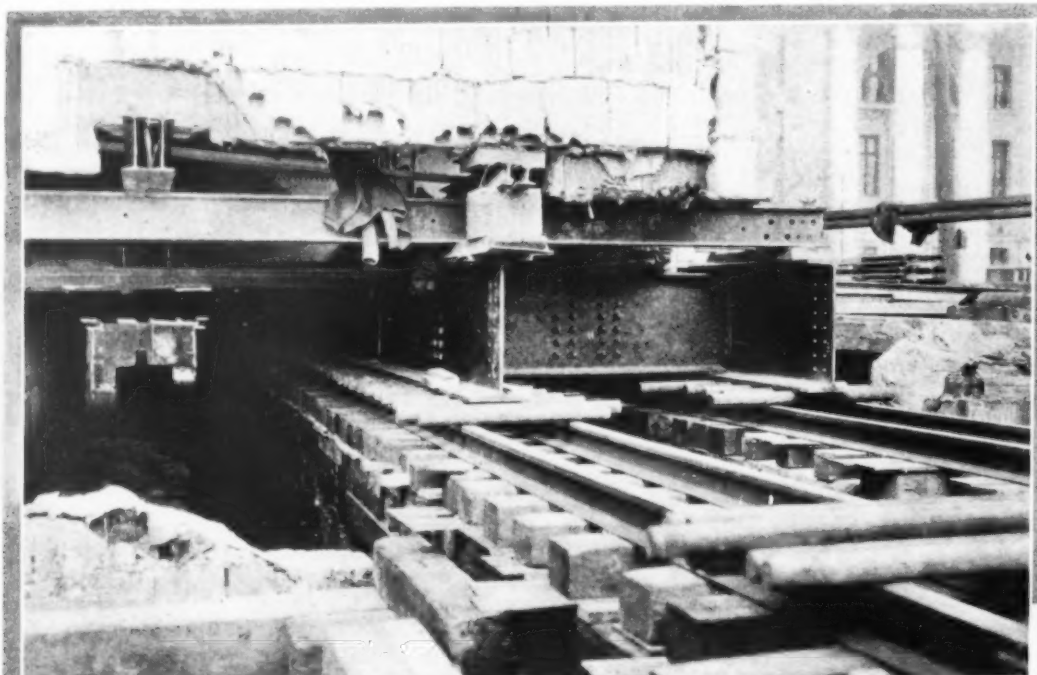


minute. State Street was closed to traffic for only 3 days as the moving proceeded without a hitch.

After the building was taken across the street, it was necessary to make a side move of 50 ft. This was accomplished by moving on to another frame of rollers placed at right angles to the first set. When the building was moved on to this set of rollers, the first set was blocked tight to keep them from moving and the second set was then used for the side move. This method saved the time it would have taken to change the first set of rollers so they could roll at right angles to their former direction.

The new foundation was placed before the building was moved over. It consisted of a solid mat of concrete 2 ft.

3 in. thick, reinforced top and bottom, covering the entire area under the building. The building was moved on to the foundation and then lowered 4 ft. 6 in. to its new elevation. The lower sections of the columns were cut away from the old footings, taken to a structural shop where billets were placed on the bases of them. They were then put on the new foundation and spliced back on the same columns they were cut from. The bases were then wedged up and grouted into the footings. The load was then transferred again from the 28-in. beams to the columns and all the steel used for the temporary frame taken out. Partition walls were then constructed in the basement and the building was exactly the same as before.



At left—The construction of the tracks and the rollers used in moving the building is shown in this photograph. Twelve hundred 3-in. steel rollers were used

Below — The building on its way to its new site. The horses which did the moving may be seen in the right center of the photograph



At right—A typical photograph of the Ft. Frederick apartment during the moving operation. This picture shows the way in which the tracks on which the building moved were laid



Below — Looking south on State Street when the Ft. Frederick was crossing that important thoroughfare. A corner of the State capitol may be seen at the left of the apartment being moved

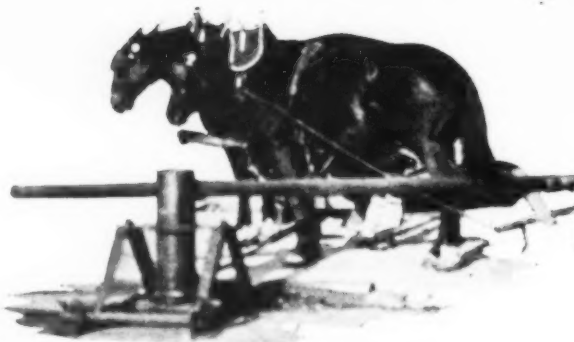


All the work was done without injury to the plaster or walls.

There were 1,000 of the 5-ton screw jacks used in raising and lowering the building and 1,200 steel rollers used in moving.

The building was moved from the Southwest corner of Washington Avenue and Swan Street a distance of 350 ft. parallel with Swan Street, then across State Street. Then it was moved 50 ft. parallel with State Street to its new location. The total distance moved was 400 ft.

Emil Danenhauer, Chief Engineer for the John Eichleay, the new West Virginia State Capitol at Charleston.



These faithful creatures furnished the motive power for moving the big building which weighed 4,000 tons

Jr., Co., was in charge of the work and J. C. Walters was superintendent of the job. The Foundation Company of New York built the new foundation. The work was started on September 15 and will be finished about February 1.

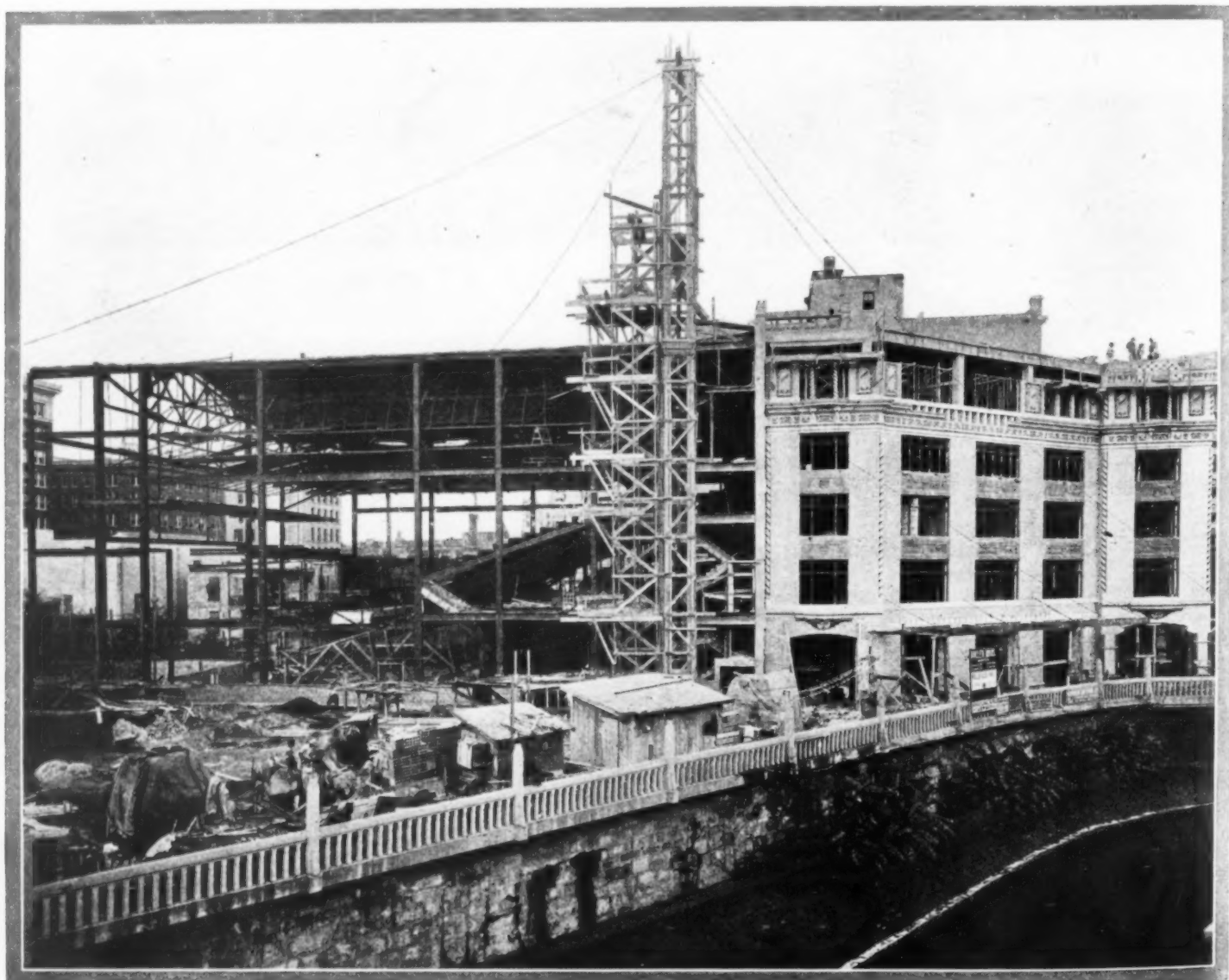
This is not the first time that the John Eichleay, Jr., Co. has been engaged to move a structure to make way for a new state building. Recently the company moved 28 buildings across the Kanawha River to make space for

Temporary Scaffolding Saves Time and Money

AN INGENIOUS feature was worked out in the construction of the Texas Theater building in San Antonio, Texas, recently completed. This project, which has a steel frame, was rushed through by erecting a temporary scaffold which was suspended from the steel girders as shown in the photograph below. In this way the work of putting in the auxiliary steel work, the wood construction,

the plaster and the painting and decorating, was under way before the sides of the building were started. This made it possible to complete the entire job at one time and not finish the painting and decorating later, as is the practice in the construction of nearly all large buildings.

Walsh & Burney, of San Antonio, are general contractors and the work is under the supervision of A. A. Hasbrook.



Asiatic Road Building



The Persian method calls for plenty of donkeys, primitive baskets, unique shovels and a young army of men.

© E. Galloway

In Japan this Koehring mixer, operated by Japanese workmen, has been laying many miles of concrete pavement.



SCATTERING OUR MONEY

THE first prize in our February photographic contest is going to take a trip to the Guernsey Dam in Wyoming. F. T. Crowe, superintendent for the Utah Construction Company, wins the \$25.00 award. His winning photographs can best be described by quoting from the letter in which he enclosed them:

"You are familiar with the modern convertible shovel

which you advertise, which can be changed to a hoe in so many minutes and odd seconds, and then to a dragline or a pile driver or a back-scratcher or whatnot.

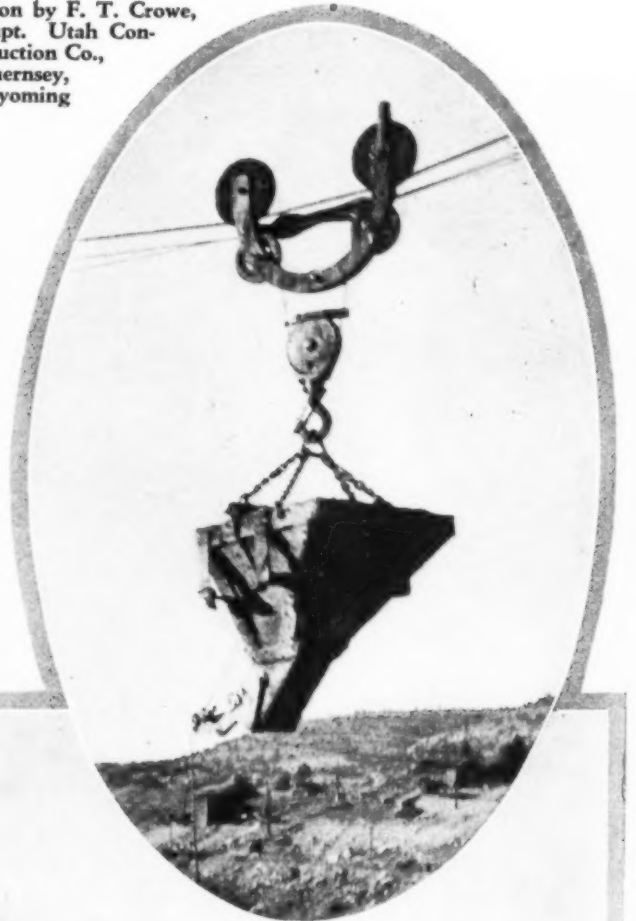
"Well, this is the story of a little old Marion 20 shovel that has battled through hard rock for the past twenty years. It came over to the Guernsey Dam and dug out 40,000 cu.yd. of tunnel muck on the 34-ft. diameter diversion



First Prize

\$25.00

Won by F. T. Crowe,
Supt. Utah Construction Co.,
Guernsey,
Wyoming



Wyoming, Missouri and New York Win Prizes in the February Photographic Contest

tunnel. As soon as it was through with this, we backed it under a cableway tower and immediately changed it from a lowly shovel to a cableway hoist by throwing off the digging chain and attaching the load line to the digging drum

and throwing off the swing cables, and attaching a home-grown endless drum to the swing drum. On this the endless cable was wound and we were ready to 'cableway.' We have a hoisting speed of about 150 ft. per minute and convey at about 300 ft. per minute. It works just splendid, and we saved a large hunk of freight from these long Western railroads."

The Guernsey Dam is a \$2,500,000 power and storage development being built by the United States on the North Platte River in Wyoming. The Utah Construction Company is the contractor building both the dam and power plant, which will be described fully in a later issue of *Successful Construction Methods*.

Second Prize

\$15.00

Won by F. Y. Parker
War Department, U. S. Engineer's
Office, Kansas City, Mo.

The second prize of \$15 goes to F. Y. Parker employed in the United States Engineer's office at Kansas City, Mo. His photograph shows a phase of the construction of retards used at the mouth of the Missouri. These retards, some of which are 550 ft. in length, are anchored to concrete piles jettied about 30 ft. below the river bed. Trees are hauled to the river, made up into units on barges and towed to the place where needed. The photograph shows the launching of a unit.



Third Prize

\$10.00

Won by Charles T. Fisher,
New York State Bureau of
Highways, Binghamton, N. Y.

A Senior Assistant Engineer in the New York State Bureau of Highways, Charles T. Fisher, wins the third prize of \$10 for his photograph of the cement loading platform used by Owen P. Williams in building seven miles of concrete road between Bainbridge and Coventryville, N. Y. The cement, in bags, was taken directly from the railroad cars, emptied into steel hand carts containing seven bags each, wheeled across the platform and dumped into the cement compartments of the batch boxes.



ENTRIES FOR THE MARCH photographic contest are now in order. The awarding of the three prizes, \$25 for the photograph most suited to the needs of *Successful Construction Methods*, \$15 for the second best and \$10 for the third best has stimulated great interest among the amateur camera men on the various construction jobs throughout the country. Send along some photographs and see if you can't be among the lucky ones for March.

The conditions remain as before. The photographs must be taken by a man actually employed on the job and should be sent to *Successful Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Thursday, February 10, and plainly marked Photographic Contest. Photographs received after that date will be entered in the April contest. *Successful Construction Methods* will pay for all non-prize-winning photographs which it uses.

Hilltop Job Handled by

All Materials for Big Church in Wisconsin Hauled Up Steep Slope

CONFRONTED by the problem of getting the materials for a big church to the top of a steep hill, known as Holy Hill, H. Schmitt & Son, contractors of Milwaukee, decided to build what they call a skip hoist at one of the steepest points on the hillside. With this arrangement it was possible to bring the materials, including brick, stone, steel and concrete aggregates, to the foot of the hill in motor trucks, and then pull them up to the top in less time than it takes to tell about it.

The photographs which accompany this article show the skip hoist in operation. The concrete aggregates were

The photograph at the right and the one in the small circle below show the two derricks which handled the stone when it arrived at the top of the hill on the skip hoist. The derrick boom attached to the tree picked it up from the hoist and swung it to a point where the derrick set on the gallery floor of the church could reach it

The large photograph at the bottom of the page and the small one in the circle just below show the skip hoist. On the day these photographs were taken, the masons were not working, so only three wheelbarrows instead of the usual eight are making the ascent. The shed in the foreground is used to house the cement

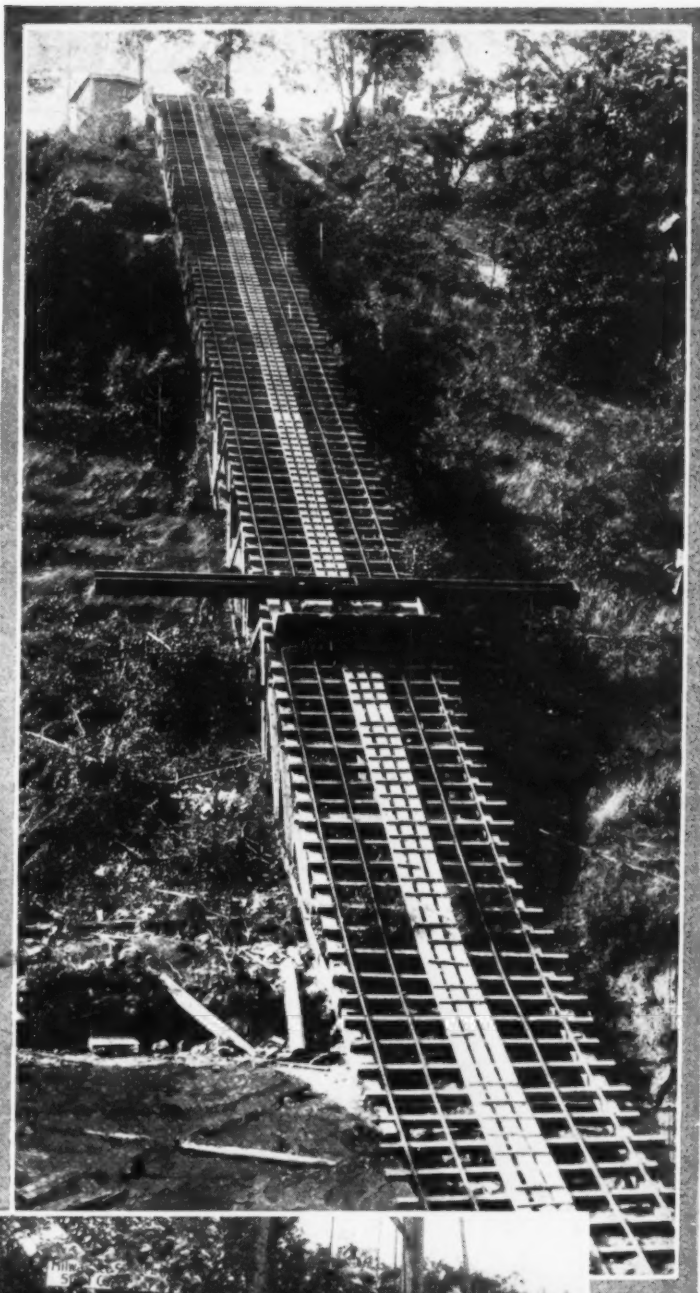


Skip Hoist

hauled up in wheelbarrows, the skip being able to accommodate 8 barrows on each trip when the mixer was in operation. The mixer itself was stationed at the top of the hill. The biggest part of the job was the hauling and weighing of the cut stone which was brought in by motor trucks from Milwaukee 28 miles from Holy Hill. Upon reaching the top of the hill on the skip, the heavier stones were lifted from the skip by a derrick boom using a tree as its mast. This boom was in range of another boom set on the gallery floor of the church, which was used to set the stone on nearly all of the front of the building where most of the cut stone is used.

In spite of the unusual situation of the job, work is being continued during the winter months and some of the photographs which accompany this article were taken during the present winter. They were sent to *Successful Construction Methods* by Albert O. Schleisner who is the superintendent in charge of the job. Mr. Schleisner and Mr. Schmitt, head of the contracting organization, may be seen in the photograph which shows the ceremonies which took place in the latter part of last August when the cornerstone was laid. As Mr. Schleisner puts it in his caption on the back of the photograph, "Yours truly is the man doing the strong arm act on the derrick."

This view of the skip hoist at the right, which was taken last summer, shows it hauling steel. The photograph below shows the laying of the cornerstone. Superintendent Schleisner is the man working at the derrick, and immediately behind him next to the officiating priest is Frank Schmitt, president of H. Schmitt & Sons of Milwaukee, the contractors who are building the new church



Power House Begins Work Seven Months

PUTTING up a power house in seven months is a performance of which the W. S. Barstow Management Association, Inc., is justly proud. The structure was built for the Florida Public Service Co. at Benson Springs, Florida, and is known as the St. John's River plant. The work was done during the summer months when central Florida is inclined to be too hot for comfort, and inadequate transportation facilities added to the difficulties of the job. Furthermore, at the time work began in the early part of last year, a freight embargo was in force which delayed shipments of material and equipment.

The site for the new power house, a tract of 57 acres situated on the northern side of Lake Monroe, was acquired on Jan. 19, 1926, but due to the embargo and other reasons, construction did not get fully under way until March 1st. Despite these delays, the first unit of the new station was placed in service on Sept. 5, just 229 days after the acquisition of the property.

Smooth Running Construction Organization Sets Fast Pace on Florida Job

The first jobs which confronted the Barstow organization were the construction of a pier extending 600 ft. into Lake Monroe and one-half mile of standard gage track from the Florida East Coast line to the power house site. The pier which is shown in the photographs on page 26 was constructed in 11 days. In order to build the spur track, it was necessary to clear and grade a right-of-way through a swamp where a fill from 6 to 8 ft. in height was necessary. Photographs showing the construction of this spur track appear on this page. In addition to building the pier and siding, a number of dwellings were put up for the workmen on the job.

After all this preliminary work had been completed, work on the power house itself was pushed steadily until the building was finished. The three photographs on page

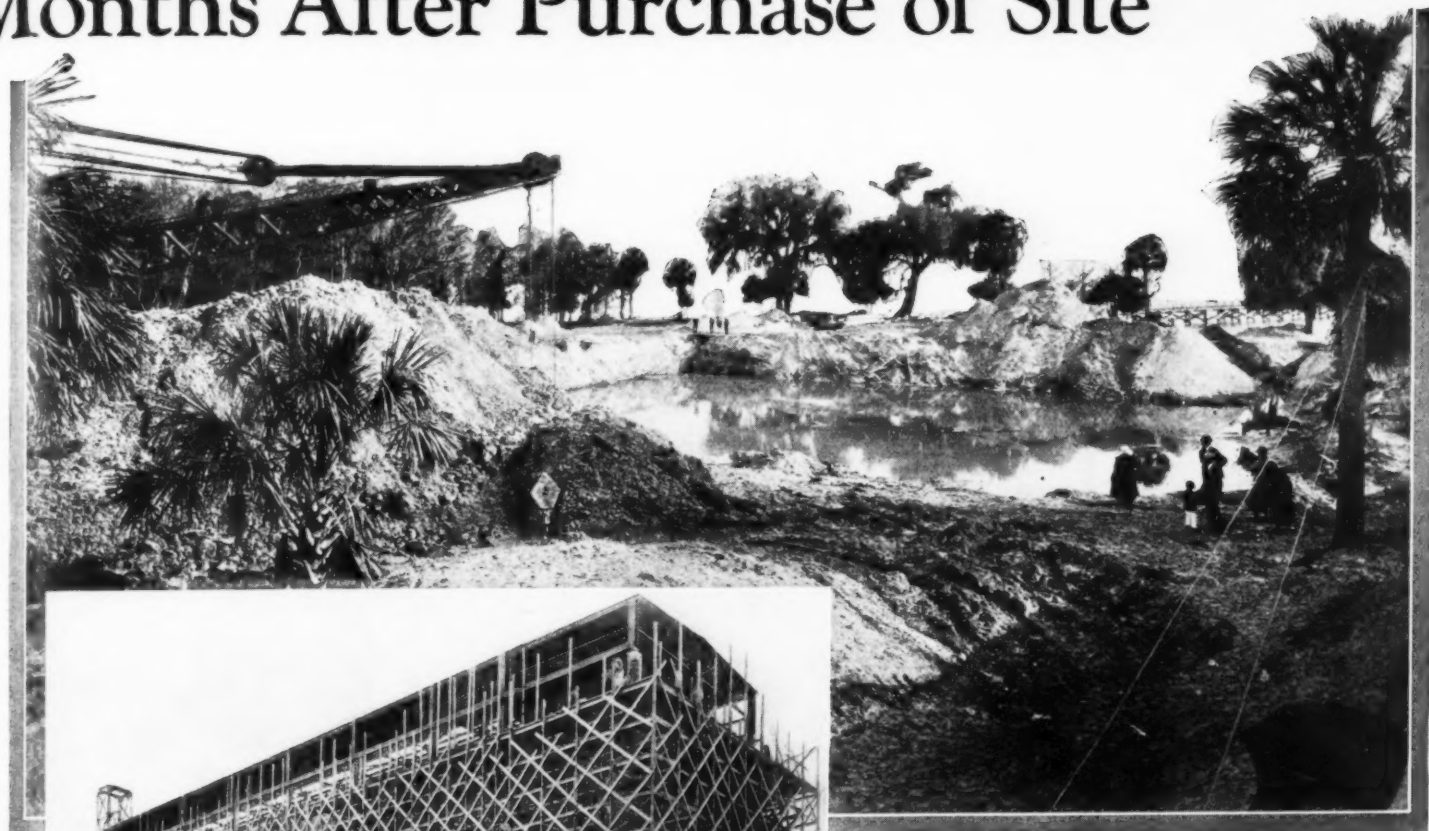


At left—Clearing and grading for railway track extension from main line to site of power house. This line ran through a swamp making a fill necessary

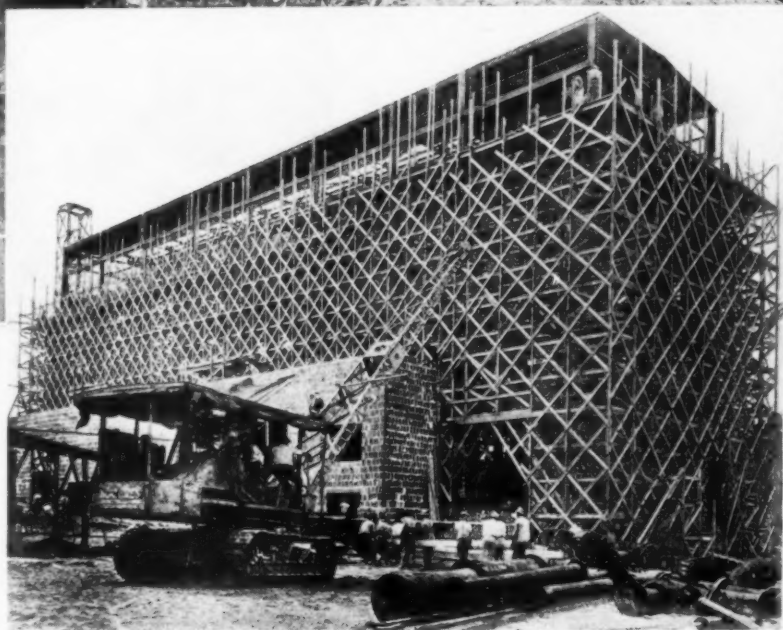
At right—Ready for laying tracks on railway siding. Transmission lines for supplying current during construction shown at right of fill



en Months After Purchase of Site



Above—Excavation for the power house. About 18,000 cu.yd. of material was moved



At left—Power house under construction showing scaffolding for building tile walls

Below—Concrete plant pouring foundation mat for power house



At right — This pier extending 600 ft. into Lake Monroe was built in 11 days. The city of Sanford is across the lake opposite the power house site. Steamers of the St. John's River Transportation Company brought construction materials to this pier



At left—Another view of the pier while it was being built. This photograph gives a good idea of the design of this structure

25 give an excellent idea of the way the work was handled. The upper picture shows the excavation for the power house building. Most of this work was handled by a Northwest shovel. The central photograph shows the building under construction with the Northwest in the foreground, this time doing duty as a crane. The elaborate scaffolding shown in this photograph was put up for handling the construction of the hollow tile walls. The arrangement of the mixing plant is shown in the photograph at the bottom of the page. The building, which is 146 ft. long, 145 ft. wide and 90 ft. in height, rests on a reinforced concrete mat containing about 6,200 yd. of concrete and 200 tons of reinforced steel. This photograph was taken while the pouring of the mat was under way and shows the reinforcing in place ready for the concrete. A Ransome mixer handled the job. Materials were brought in on the spur track and were piled close to the mixer. An American derrick and a portable conveyor, which may be seen at the right of the lower photograph, handled the aggregates.

The photographs on this page show two views of the pier that was built 600 ft. out into Lake Monroe and was completed in 11 days. This pier was of the greatest assistance in the convenient transportation of materials during the construction of the power station.

The St. John's River Station was built to meet the rapidly

increasing power demands of that section of Florida. The fact that these demands were so urgent was the main reason why the station was started and rushed to completion in a little more than seven months. The station was designed by and built under the general direction of the company's own engineers and a construction force of more than 400 Florida workmen was employed.

The power station is so arranged that its capacity can be doubled without further extensions to the present building. It is designed to operate either with oil or pulverized coal, as it was felt that since oil was very abundant and easy of handling in Florida this additional assurance of first-rate service would be given to consumers. It has been supplying power ever since its opening in September and is operated by a force of fifteen men, including the chief engineer.

The photographs and material for the article were sent to *Successful Construction Methods* by A. P. Campbell, Chief Construction Engineer of the Barstow organization. E. M. Gilbert is Chief Engineer, and J. A. Powell Mechanical Engineer of the Barstow Management Association. During the time the job was under way, H. H. Oswald was Resident Engineer, G. E. Turner Superintendent, G. L. MacNeil Sponsor Engineer. It was largely due to their efforts that the work went through so smoothly and the building was completed in such a remarkably short time.

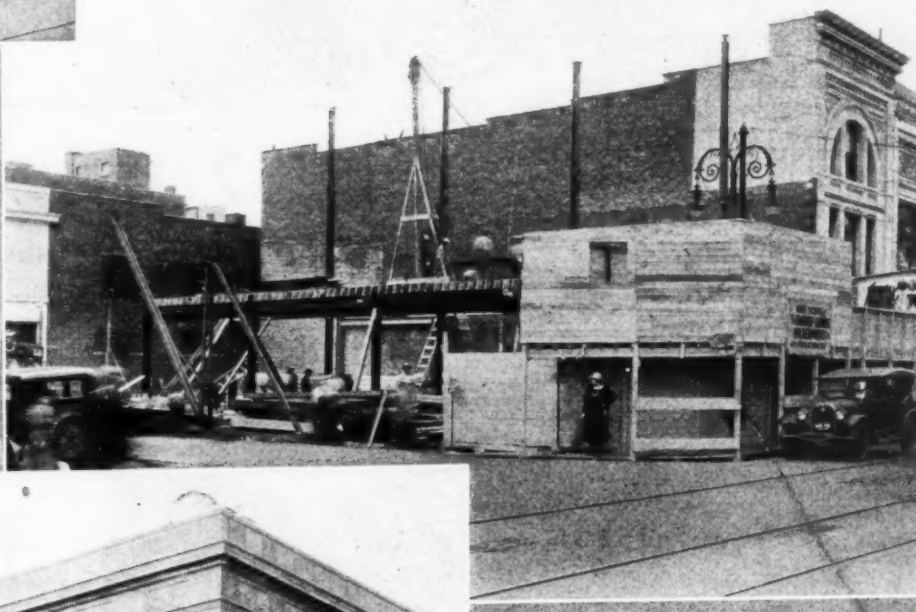
A Pictorial Record

Of an 83 Day Job



The Start

Working under a penalty and bonus contract, the Gettins-Kopitke Company of Toledo, Ohio, recently erected a 3-story building in just 83 days. This period included the time spent in wrecking the old building which is shown in the photograph above. It took exactly 7 days to tear down the old building which had only half a basement



One Month Later

The photograph just above shows the progress made on the new building 30 days after the Gettins-Kopitke organization went to work. It was necessary to go down 10 ft. further than had been expected, causing a week's extra work. At the time this photograph was taken, the steel work was being erected. It was handled by derricks operated by a Clyde gasoline hoist

All Done in 83 Days



After Two Months

After 60 days of work the exterior of the building was nearing completion, as shown in the photograph above. The walls were built of Bedford stone which was handled by a stiff-leg derrick, the gasoline hoist also taking care of this work in a most satisfactory manner

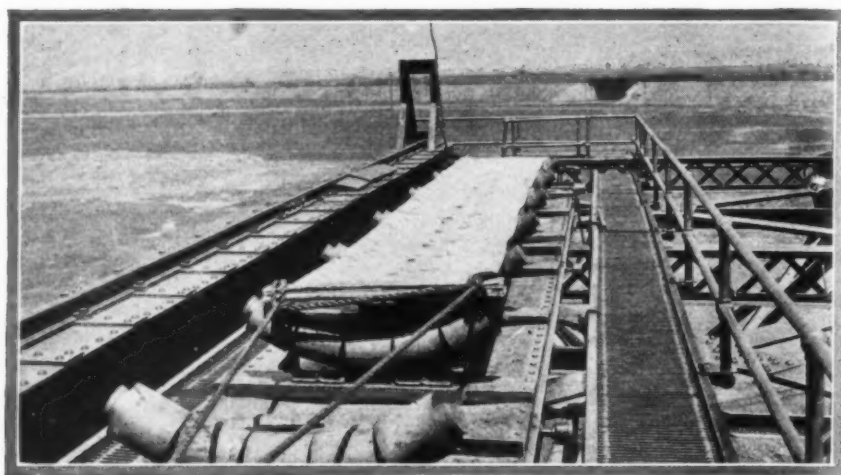
The completed building is shown at the right as it appeared just 83 days after work of demolishing the old building began. All of the show windows were completely assembled at the shop and painted before they were sent to the job. This necessitated very accurate measurements and careful attention to details



Step-by-Step Field Methods—How



1 MOUNT BELT ROLL on pipe or bar blocked up near end of conveyor to turn freely. Side of belt with thickest rubber cover on top.

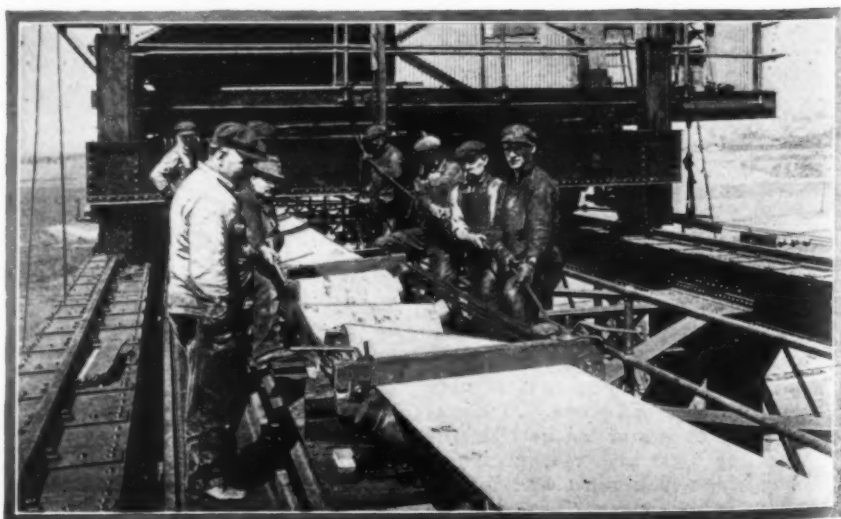


2 STRETCH A ROPE over the idlers and pulleys, attach the end of it to the belt and pull the belt into place with any available power.



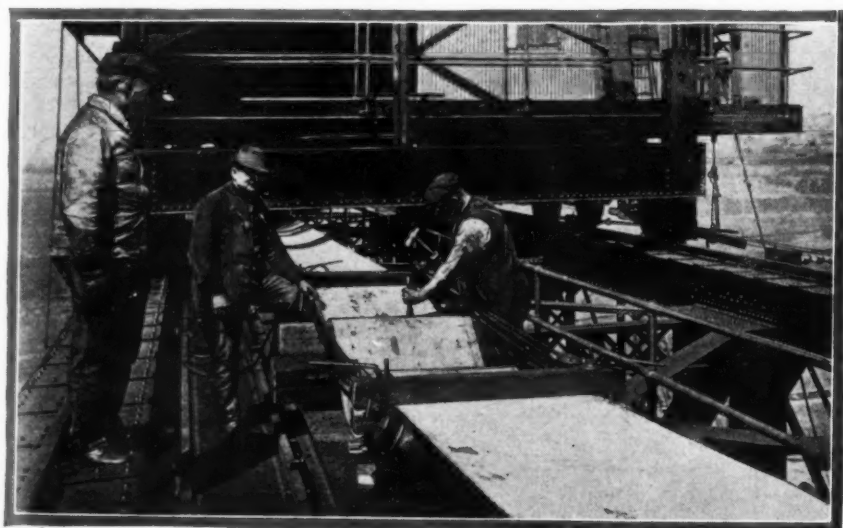
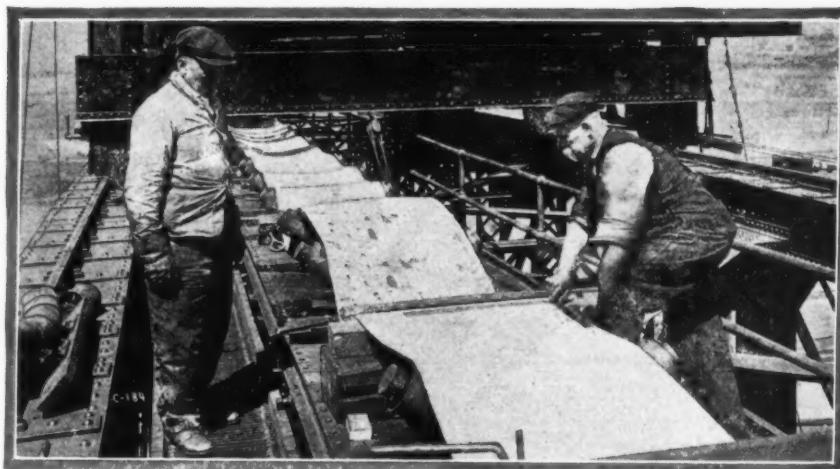
3 JOIN BELT ENDS on upper run of conveyor. Run back take-up screws and straighten belt on end and tripper pulleys. Fasten one clamp 3 ft. from one end of belt and another clamp on other end 20 ft. from first one.

4 PLACE ROPE SLING on the four ends of the clamps and connect with two rope tackles or chain blocks. Pull belt to required tension, indicated by absence of undue sag between return idlers.



to PUT A BELT ON A CONVEYOR

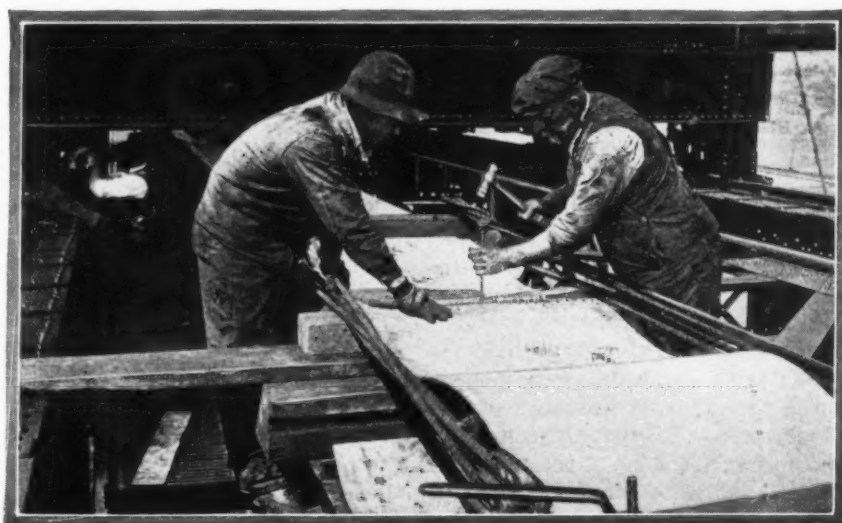
5 CUT OFF SQUARE, with sharp knife, the short end of belt and cut surplus length from other end so that ends meet. Then place soft-wood block on decking under joint to raise belt above troughing idlers.

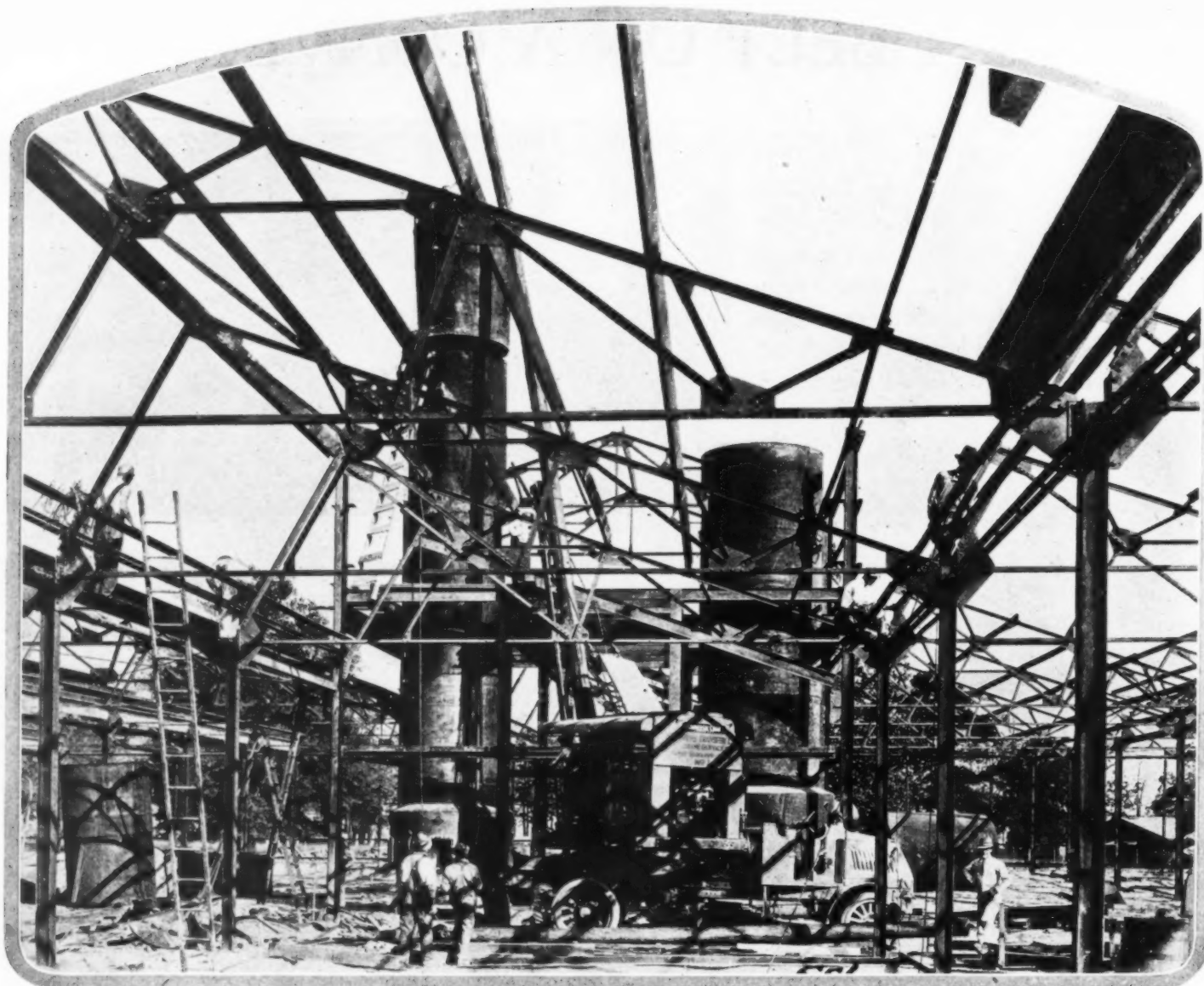


6 NAIL ENDS OF BELT to block to hold joint together. Place sections of metallic belt lacing $\frac{1}{4}$ in. apart across belt at joint and mark belt by tapping each section lightly with hammer.

Photographs and instructions covering approved practice from Robins Conveying Belt Co., New York.

7 PIERCE BELT on all marks with awl or wire nail, paint ends with rubber cement, and drive in the sections of metallic lacing, striking them over the prongs, not in the center. Then turn belt together with clamps and tackle, upside down, lay joint on steel rail or iron bar and, after setting belt well down on the hooks with a hammer, clinch hooks toward center joint.





Crane Works in Maze of Steel

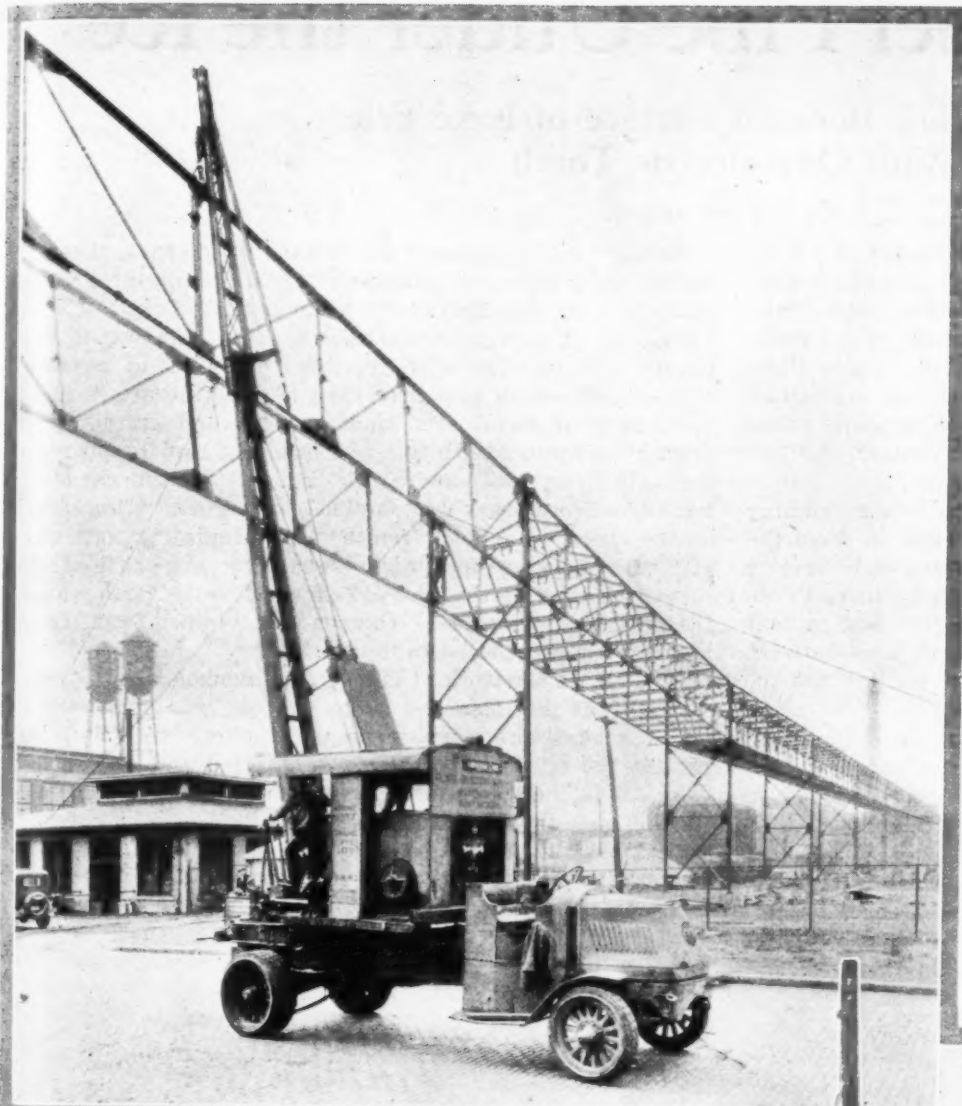
Mounted on Motor Truck It Handles Erection Job
in Close Quarters

THE value of mobile equipment in construction work has rarely been better illustrated than by a job done recently by a Universal crane in Birmingham, Alabama. This crane mounted on a Mack truck unloaded 225 tons of structural steel, hauled it to the site of the job and then erected it in the short space of 72 hours.

This work was done on a new building for the Alabama Foundry Company by the Summers Transfer Co. of Birmingham. The crane crew consisted of two men, an operator and a driver for the truck. Because of the frequency with which the crane moved from one portion of the job to the other, it was necessary to have a driver on duty at all times. As may be seen by an inspection of the photograph at the top of this page the erection of the steel was an intricate job. For some of the higher work the standard crane boom was extended by means of a temporary

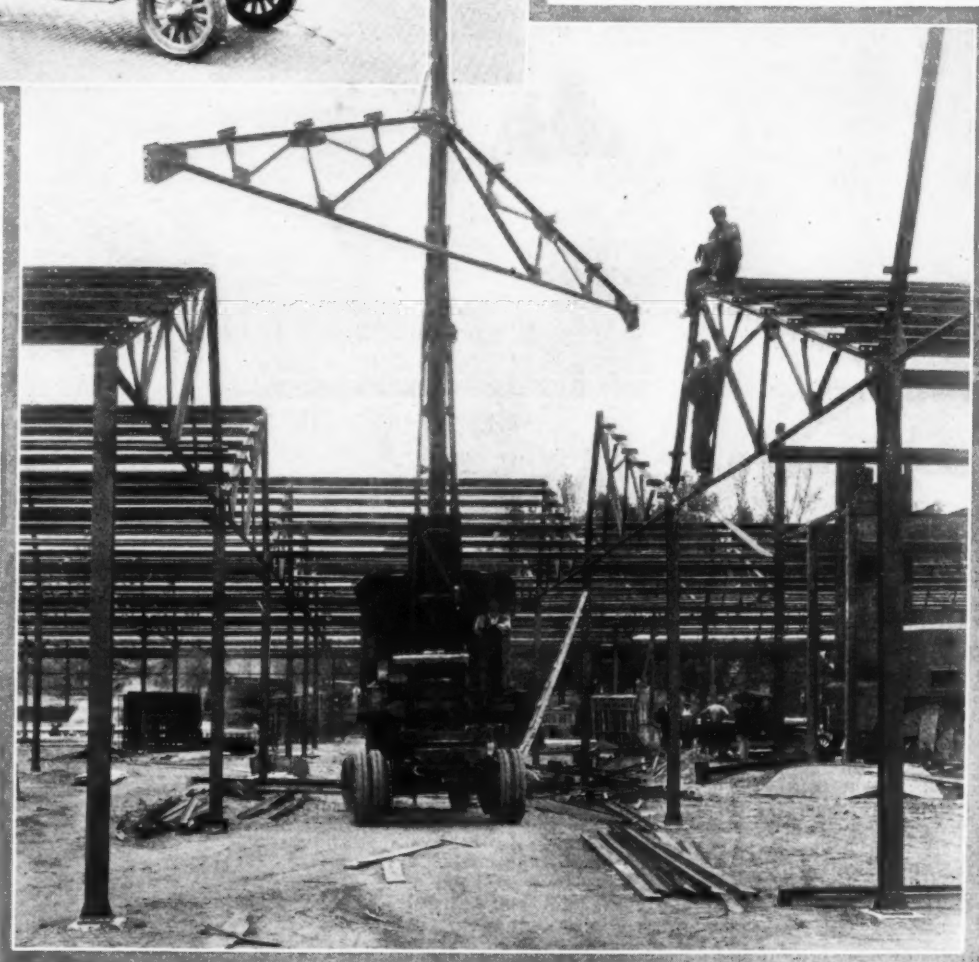
timber extension to a length of 50 ft. In the picture there is a clearance of 58 ft. 6 in. between the head of the boom and the ground. The crane wove itself in and out of the new building without difficulty and the lower photograph on the opposite page shows how this part of the work was handled. Aisles were left in which the crane worked building up the steel on both sides. The open spaces then were filled as the crane worked its way out through the aisles. The machine did its job so well that it was kept at work placing the cupolas, a part of the work which was not included in the original schedule assigned to the crane.

The upper photograph on the opposite page shows another crane erecting steel for a conveyor system. On this crane a standard steel boom head extension was being used extending the boom to a length of 44 ft. This extension is used when there is considerable long boom work to be done.



The photograph at the left shows a motor truck mounted crane erecting steel which forms part of a conveyor system. The boom of this crane is extended by the addition of a steel head extension which greatly increases the length of the boom and which can be used whenever there is considerable long boom work on the crane's schedule. This steel extension makes the boom 44 ft. long

The crane shown at the right is working on the Alabama Foundry Company's job described on the opposite page and shown in the large photograph at the top of that page. In erecting the steel aisles were left in which the crane worked, always leaving sufficient room for it to work its way out into the open after setting the last of the steel. The wooden boom extension used on this crane makes the distance from the boom head to the ground 58 ft. 6 in. when fully raised



Cutting Steel Pipe Under the Ice

Divers Work Beneath Surface of Lake Erie With Oxy-electric Torch

By L. F. Hagglund

DURING February of last year the engineers of a large paper company at Erie, Pa., found that the supply of water obtainable through their 48-in. steel intake pipe was insufficient to meet the requirements of the mills. Theoretically, the pipe was large enough to supply these demands, but practically, the flow of water was inadequate and seemed to be gradually diminishing. Apparently something was hindering the flow of water into or through the pipe.

A diver was sent down to examine the intake cribbing and strainer at the mouth of the pipe, 2,000 ft. from the shore line. He reported that everything appeared to be clear at the mouth of the pipe, as he found nothing there to obstruct the flow of water. From this report it was evident that the stoppage was in the pipe itself some place between the intake and the discharge well at the shore line and the job was to find out where this stoppage was.

To determine the nature and location of the stoppage, it was decided to have divers make an examination of the interior of the pipe through the entire length of 2,000 ft. When this was discussed with the submarine contractors, their opinion was that to permit a diver to go 1,000 ft. into the pipe from each end was impractical, and to attempt to do this work in freezing weather would be extremely hazard-

To carry out this project a foreman, two divers and tenders and an oxy-electric underwater metal cutting torch were obtained from the Merritt-Chapman & Scott Corp. of New York City. This oxy-electric torch combines the heat of the electric arc, together with the oxidizing effect of gaseous oxygen under high pressure. The heat of the arc is sufficient to melt metal even under water, and the oxygen, brought in contact with this molten metal, rapidly destroys the metallic structure and effects the cut. At Erie the electric current necessary was obtained from a generating plant on the shore. One lead from a small generating unit was grounded on to the pipe directly at the shore line. The other was carried out on the ice and connected to the torch where the work was in progress. Oxygen was obtained from tanks transported over the ice to the work.

On Feb. 14 the work of cutting the manholes in the pipe started. At that time the ice on the lake was a foot thick and furnished the working stage. Shelters were built to protect the men from the snow and wind and then holes were cut in the ice to permit divers to descend to the pipe. At this time it was learned that the pipe had been covered with a backfill of 18 in. of clay and slate. This was first removed where necessary, and then the cutting of the manholes started.

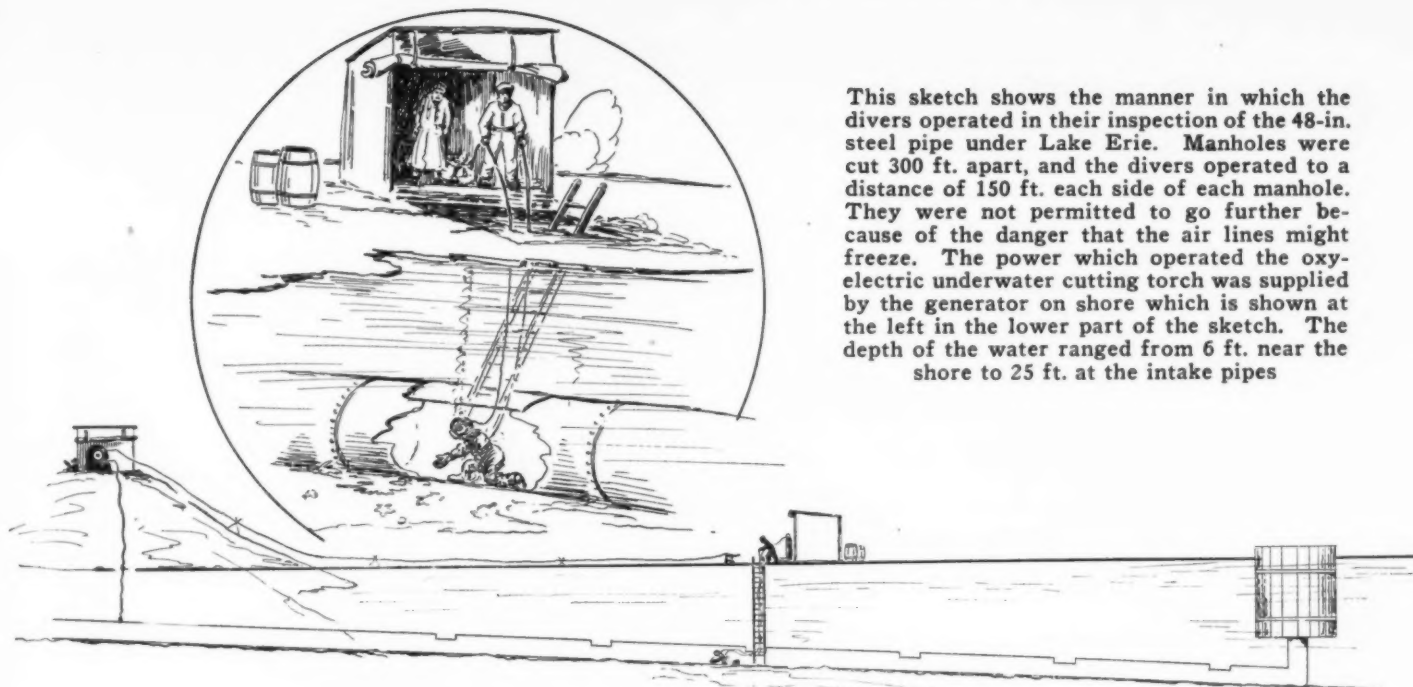


The ice was about 14 in. thick when these two photographs were taken. The shelter hut in the upper picture was moved from one location to the other as the different manholes were cut at 300-ft. intervals. The picture at the right shows one of the divers half way through the ice with his assistant about to place the helmet on his head



ous to the diver, owing to the possibility of having the air line freeze up while the diver was in the pipe.

It was then suggested that manholes be cut in the submerged pipe at several places so that the diver could enter and examine a limited area of the pipe with safety. This plan was adopted and it was decided to cut 6 manholes in the pipe between the shore line and the intake end. This would afford entrances to the pipe about 300 ft. apart and by working 150 ft. both ways from each manhole and from the ends of the pipe the entire pipe could be examined without any serious delay or undue risk to the diver.



This sketch shows the manner in which the divers operated in their inspection of the 48-in. steel pipe under Lake Erie. Manholes were cut 300 ft. apart, and the divers operated to a distance of 150 ft. each side of each manhole. They were not permitted to go further because of the danger that the air lines might freeze. The power which operated the oxy-electric underwater cutting torch was supplied by the generator on shore which is shown at the left in the lower part of the sketch. The depth of the water ranged from 6 ft. near the shore to 25 ft. at the intake pipes

The diver took down a weighted wooden guide 26 by 32 in. and placed this on the pipe where the hole was to be cut. He then took down the torch which consists of a hollow carbon electrode inserted in a brass holder at the end of the double conductor hose. This hose carries both electric current and oxygen to the torch.

Cutting at various depths 6 ft. to 25 ft. with this torch, when in position to cut, the diver strikes an arc upon the metal, releases the oxygen and cutting immediately starts. Then following the wooden guide, which the arc does not affect, the cut is completed.

During the week Feb. 14 to 20, the top of the pipe was cleared, manholes were cut and a cover made and fitted for each hole. On Sunday, when the main pumps were shut down, divers starting from the outshore end entered and examined each section of pipe. To assist in the examination a powerful electric submarine lamp was used. To assure complete examination a marker was carried by the diver first entering the end of the pipe. This marker was left

at the limit of his examination and picked up by the diver entering through the first manhole and carried in this manner through the length of the pipe.

The examination showed that there were no obstructions in the pipe, but it disclosed the presence of an air pocket at a high spot in the pipe. A vent was provided for this pocket, and an increased flow of water resulted. All manholes were then closed with covers secured by toggle bolts. These can easily be removed at any future date for necessary inspection or cleaning.

Since this job at Erie the underwater metal cutting torch has been used on the Mississippi River to cut 100 steel sheet piles at a depth of 25 ft. on the Chesapeake Bay to aid in patching the wreck of the old battleship Alabama, and on various other engineering and construction jobs. A description of the work on the Alabama, which is one of the most important operations of its kind on the Atlantic Coast, will be published in a future issue of *Successful Construction Methods*.

Testing Piles for Foundation of California Factory Building

THE accompanying photograph shows a newly driven pile loaded with 50 tons of pig iron as a test before proceeding with the driving of 2,200 piles on a job done recently by M. B. McGowan, contractor of San Francisco, for the Illinois Pacific Glass Works as a foundation for their new building in that city.

A No. 1 Vulcan hammer was used. Three piles were used in the test. The photograph shows a 66-ft. pile driven 62 ft. into the



ground. Since there was no settling of any of these test piles, the pile driver, Mr. McGowan, was instructed to proceed with the driving of the entire 2,200 piles on a basis of 65-ft. to 80-ft. piles.

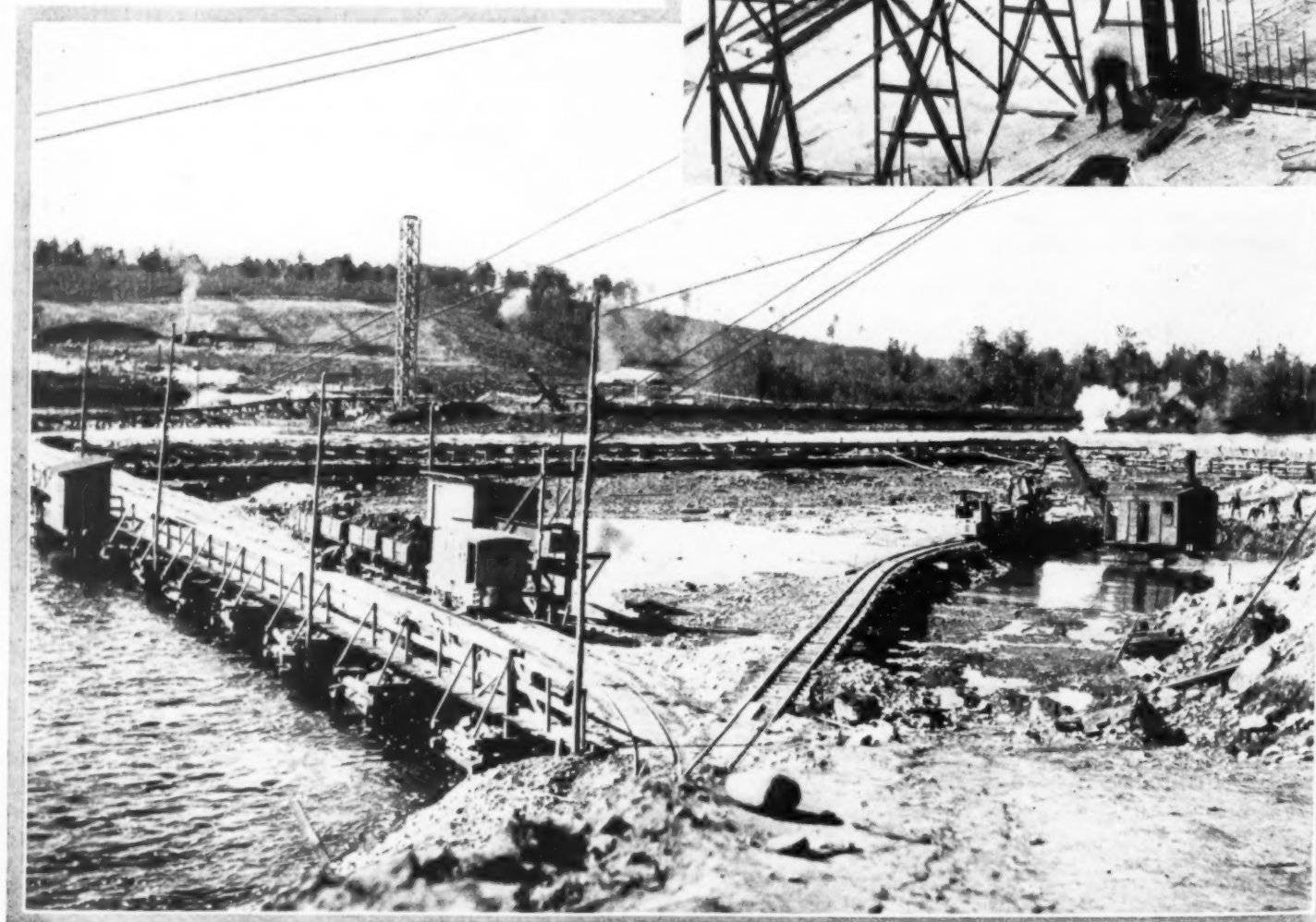
The piles were brought in from Oregon by steamers of the Charles R. McCormick Lumber Co. A wharf was available near the work for delivering them. The photograph was sent to *Successful Construction Methods* by C. R. Wilson of San Francisco.

Winter Fails to Halt Work

THE prize winning picture in the December issue of *Successful Construction Methods* showed a construction crew replacing a bridge which had been carried away by a flood on a hydro-electric power job at Kells, Michigan, where Siems, Helmers & Schaffner, Inc., of St. Paul, Minn., are building two dams for the Northern Electric Company. The promise was made in the December issue that other photographs showing this work would be published in a later issue. This promise is being kept by the publication of the accompanying photographs.

The large photograph on the opposite page shows the work on one of the dams as it looks at the present time. Work is being carried on during the winter months, and good progress is being made despite the fact that low temperatures are the rule rather than the exception in that part of the country. It is expected that the job will be finished in April of this year. Work began last July,

The work of pouring the forebay foundations for the power house superstructure on the Chalk Hill dam at Kells, Michigan, is shown in the upper photograph. The picture below shows the Chalk Hill dam looking west as it appeared in September of last year

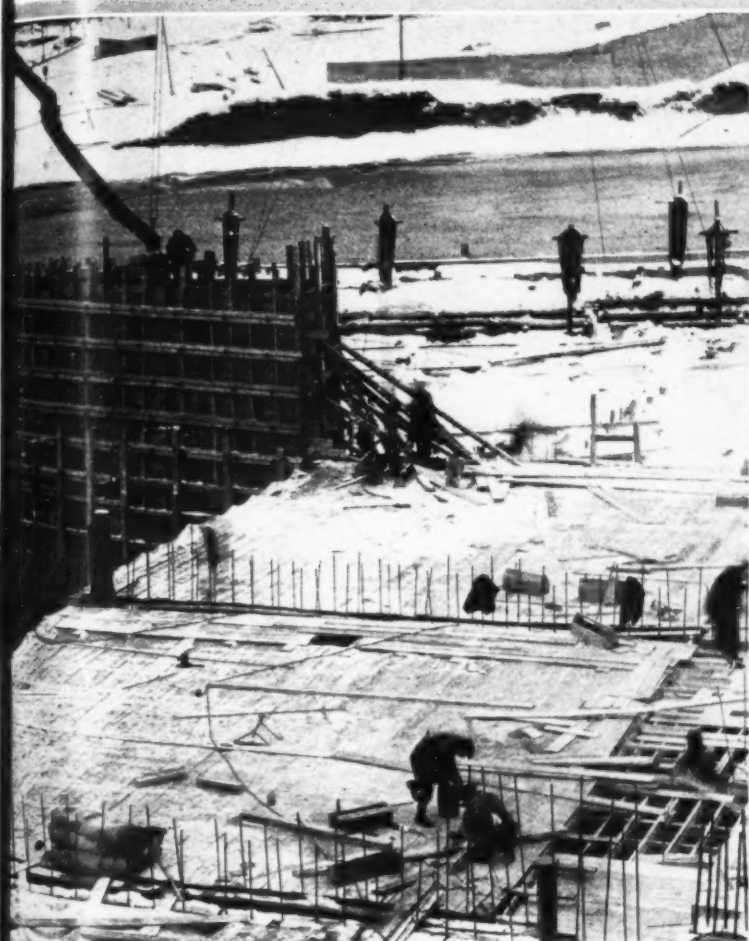


k On Hydro-Electric Job

and the contract calls for the construction of two dams practically alike. The dam shown in these photographs will provide a 28-ft. head which will develop about 32,000,000 kilowatts of electric energy per year.

The excavation on this job was handled by three shovels, two Marions and one Osgood, and a Page drag-line. The excavated material is being hauled away in Western cars, and 4 Plymouth and 2 Whitcomb locomotives are furnishing the motive power. All of the aggregates for the concrete are being produced on the job from the adjacent gravel pits, the gravel being screened and crushed with Smith equipment. Lakewood mixers and Ransome chutes are to be used in pouring the concrete. C. E. Ryan of Kells is in charge of the work on both dams for Siems, Helmers & Schaffner. The engineers who designed the work are Holland, Ackerman & Holland of Ann Arbor, Mich. About 400 men are being employed in building the dams.

This view was taken from the same point as the picture shown at the bottom of the opposite page. It shows the progress made in a little less than 10 weeks. Work will be pushed steadily on this job throughout the winter months despite low temperatures



SUBWAY TIMBERING—N

—to accommodate machines instead of hand labor

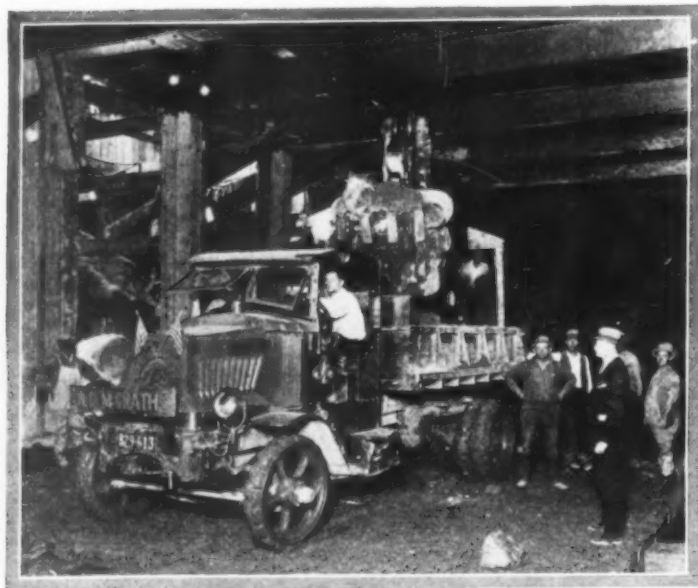
Photographs and Data from New York Board of Transportation—Robert Ridgway, chief



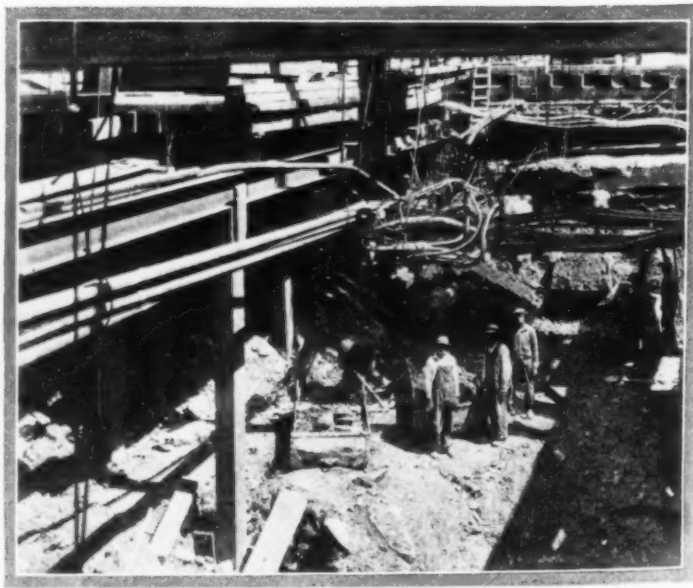
1 IN THE OLD DAYS subway construction was done largely by hand labor methods and with small tools, requiring no large clear spaces underground for heavy excavating and material handling machinery, so that—



2 SQUARE TIMBERING, involving narrow working spaces, was satisfactory as a means of supporting the timber decking built to carry street traffic. To-day, however,—



3 POWER SHOVELS loading directly into motor trucks, and other excavating and material-handling machines, call for greater working spaces with larger clearances than before. These new conditions have led contractors to use—



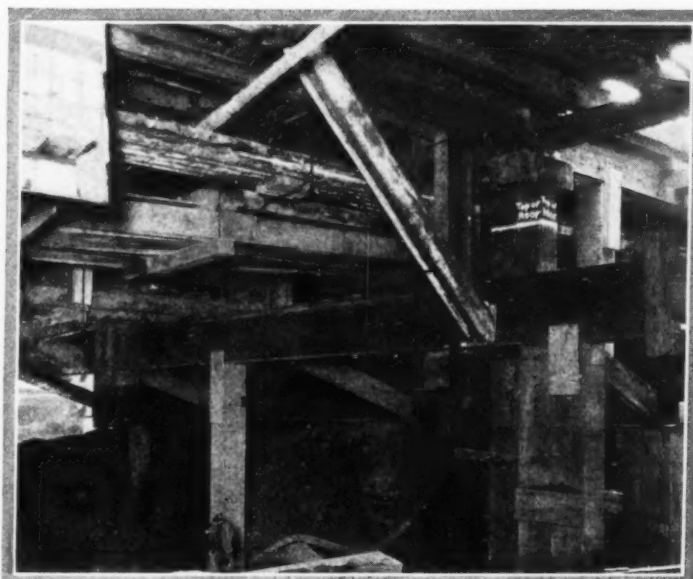
4 TRANSVERSE STEEL BEAMS spanning the cut at frequent intervals to support wooden street decking. Wide cuts are spanned by two beams overlapping at center and carried on longitudinal steel beams posted to bottom.

New Standards of Practice Developed and labor for excavation and material handling—

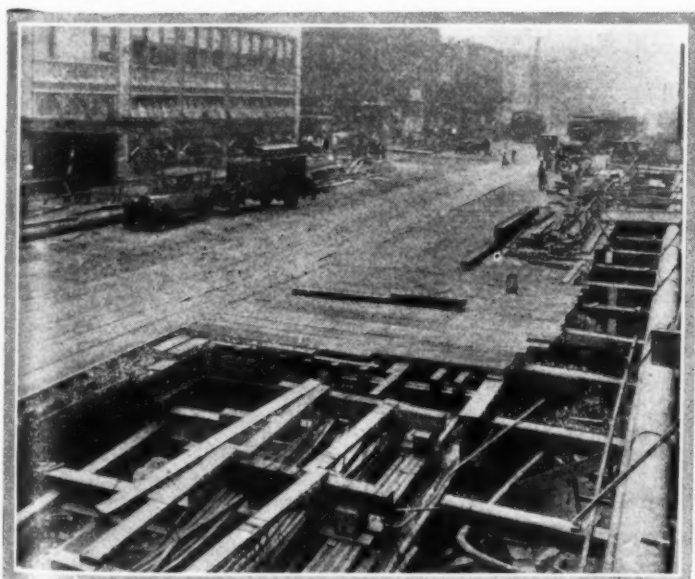
idgway, chief engineer; Col. J. R. Slattery, deputy chief engineer in charge of construction.



5 ANOTHER SYSTEM in common use consists of a series of transverse beams, posted to the bottom, and supporting longitudinal beams carrying the stringers and planks of the decking. In some cases—



6 SUB - SURFACE STRUCTURES sometimes make it impossible to place one set of beams immediately on the other, so that blocking is placed between the two sets of beams and steel stirrups used to tie them together. Where stirrups are used posts may be removed to facilitate the operation of machinery.



7 LONGITUDINAL BEAMS are commonly employed to carry wooden or steel beams on their flanges, and these transverse beams, in turn, carry the wooden stringers which support the deck planking.

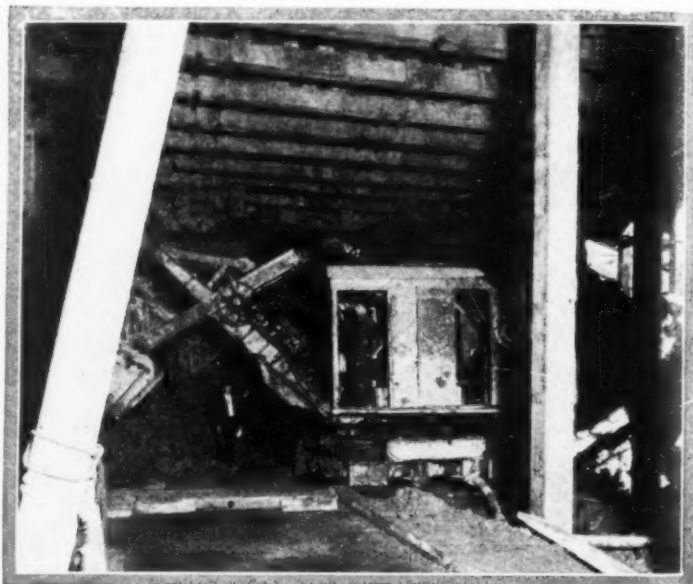


8 DECKING, IN ANOTHER CASE, is carried by wooden stringers on transverse steel beams supported, in turn, by longitudinal steel beams posted to the bottom.

MORE DETAILS of Timbering Used in



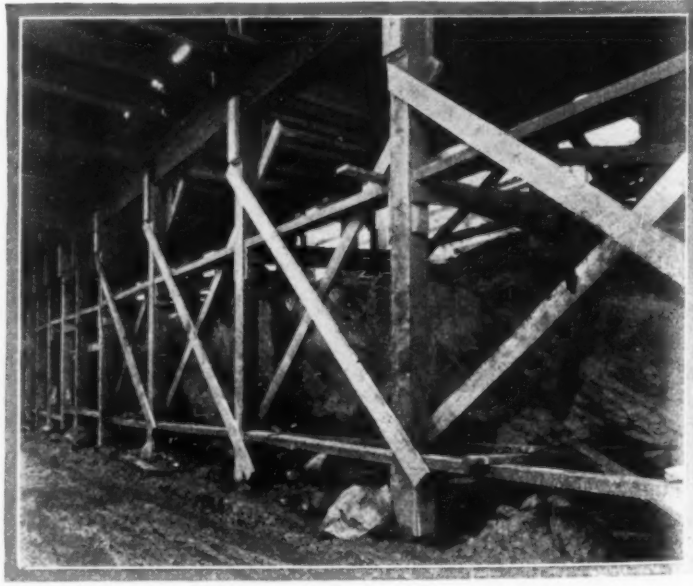
9 ANOTHER SYSTEM provides longitudinal steel beams supported on wooden caps posted to the bottom. Piping is hung from the timbering by wire rope slings.



10 STIRRUPS tie steel beams and caps together, allowing removal of a few posts to afford working chamber of sufficient size for operation of machines.



11 AS ACTUALLY APPLIED on one of the subway routes, the wooden stringers carrying the deck planks rest on blocks supported, in turn, by the wooden caps.



12 CROSS BRACING, both transverse and longitudinal, is a detail to which great importance is attached, no matter what system of decking is used.

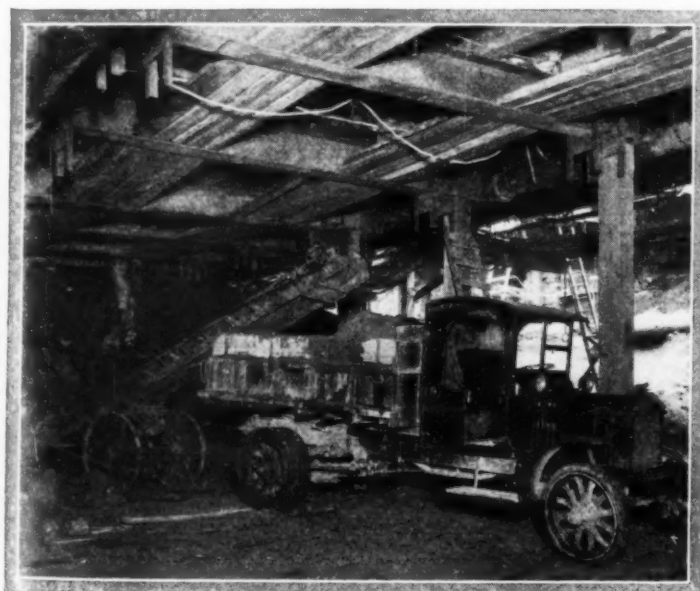
Used in Constructing New York's Subway System



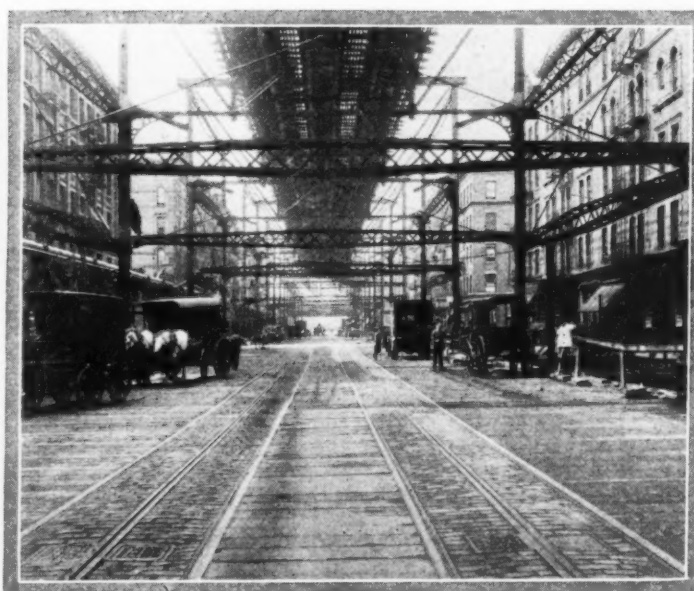
13 A SPECIAL STEEL BEAM with a discontinuous web was devised by one of the contractors for places where sub-surface structures restrict clearance under decking. Through openings in this special beam cables and pipe can be carried.



14 GREAT STRESS IS LAID by the engineers of the New York Board of Transportation upon the importance of following the excavation closely with the timber decking.



15 WHERE HEAD-ROOM IS SCANTY, and space insufficient for lateral swinging of boom, power shovels are not suitable for loading. Under such conditions portable belt conveyors are used to load the motor trucks.



16 WITH THE DECKING COMPLETED street traffic resumes its normal flow with only minor interference from the subway construction in operation below.

Mixing Plant Serves Twelve Acres

Trucks, Buckets and Chutes Carry Concrete Wherever Needed

THE problem of how to pour concrete on several parts of a job covering 12 acres presented no difficulties to the contractors for the foundations of the Dewey Portland Cement Co. plant at Linwood, near Davenport, Iowa. They erected a tower and batcher plant on the railroad spur adjacent to the site on which 13 slurry tanks with a total height of 600 ft. were to be poured, installed a $\frac{1}{2}$ -yd. Ransome mixer, put 2 hoppers on the tower, and were all set to go.

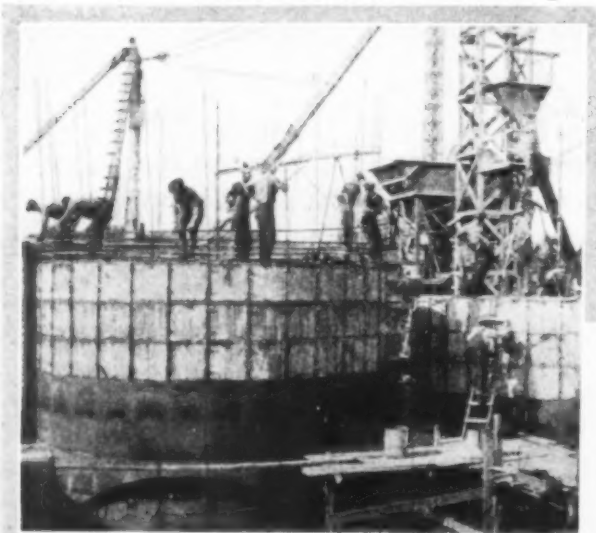
At the time the photographs on this page were taken, the lower hopper was feeding chutes to the slurry tanks, while the upper one was chuting concrete to another hopper which discharged into Insley buckets on Ford trucks. The buckets were hauled to whatever part of the job happened to require concrete at the time, where they were handled

into the forms with cranes. In this way, pouring could be carried on simultaneously at several places, and the mixer could be run at capacity all the time.

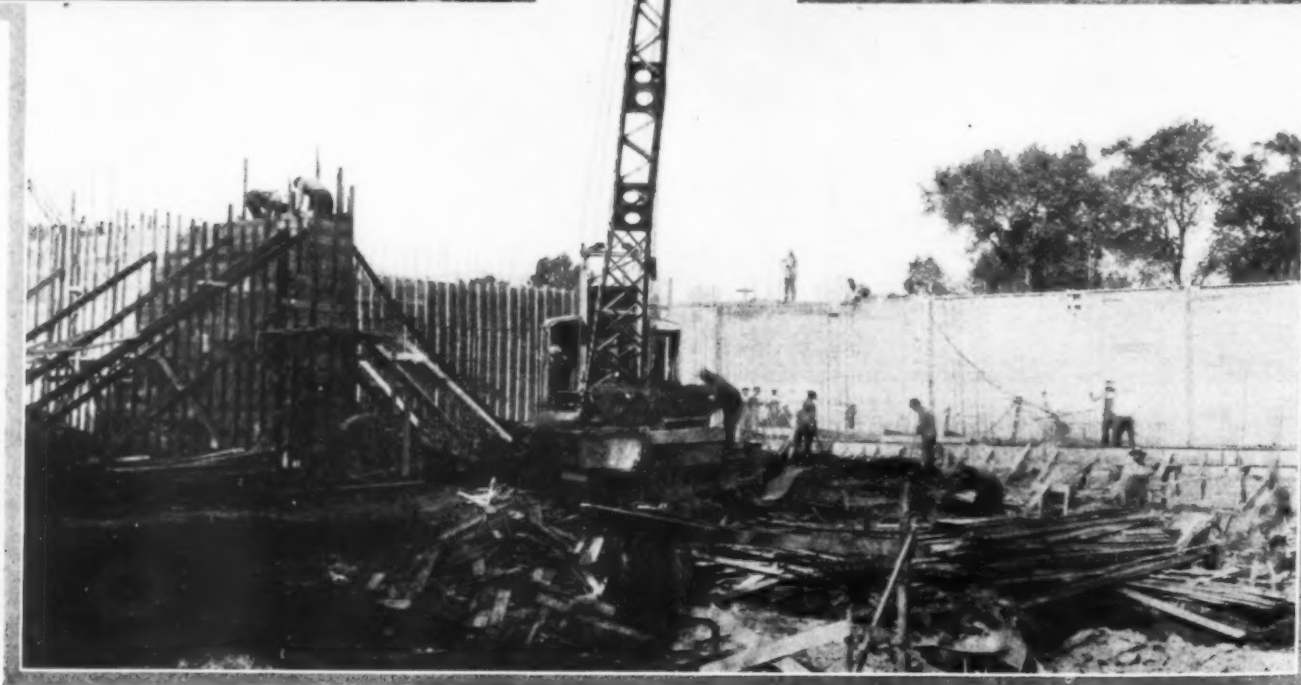
Great care was taken with the concrete, and an inundator was used in proportioning the sand. Outside of the slurry tanks, the concrete went into foundations for buildings and machinery scattered over the 12 acres. The forms for the tanks are clearly shown in the upper left-hand photograph on this page.

The total amount of concrete required for tanks and foundations amounts to about 15,000 cu.yd. In the first month of work the plant poured an average of 150 cu.yd. of concrete daily. John C. Tunnicliff is superintendent for the Priester Construction Co. of Davenport, the contractors, and is the man responsible for the good results obtained.

Placing reinforcing steel on slurry tank while concrete is being poured on tank at right

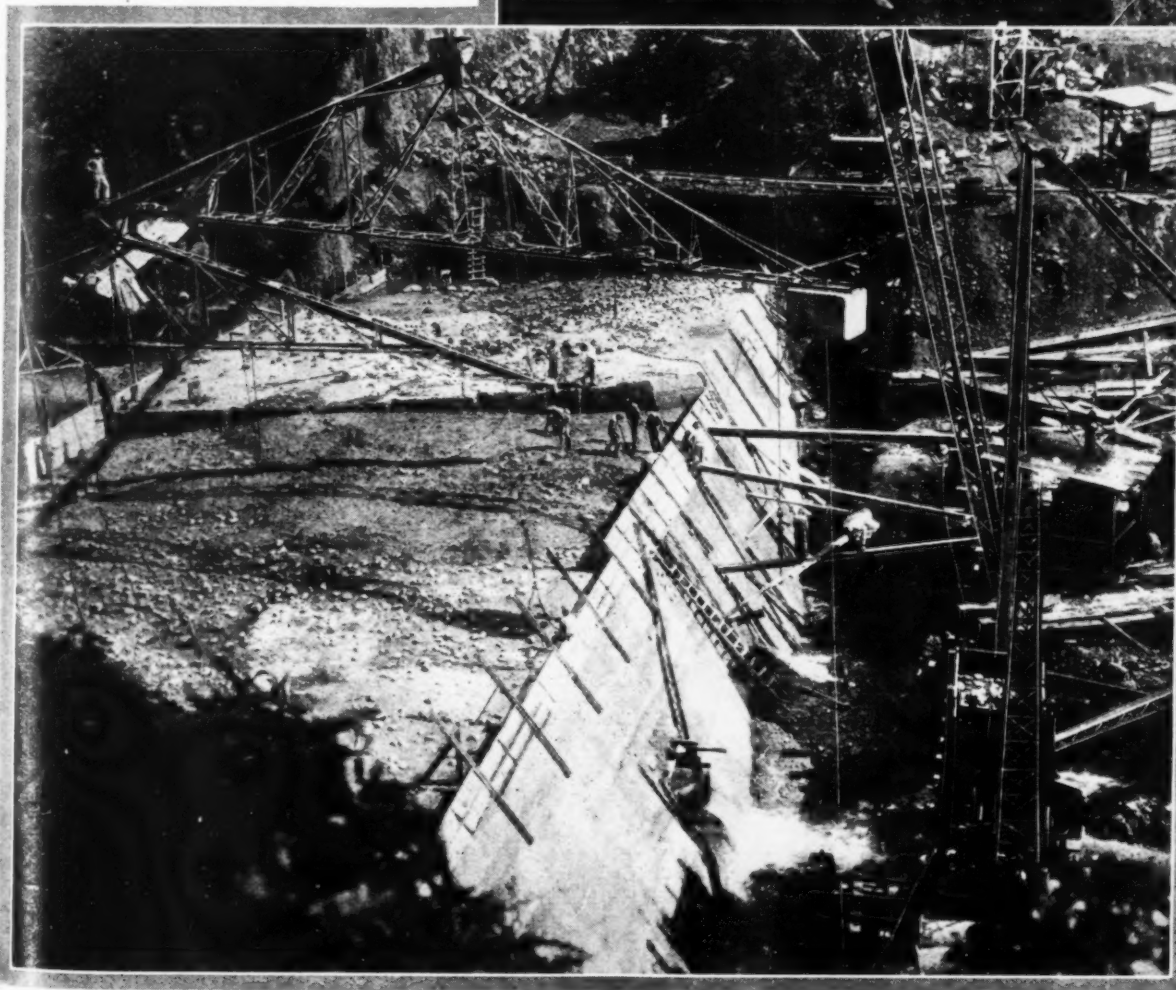
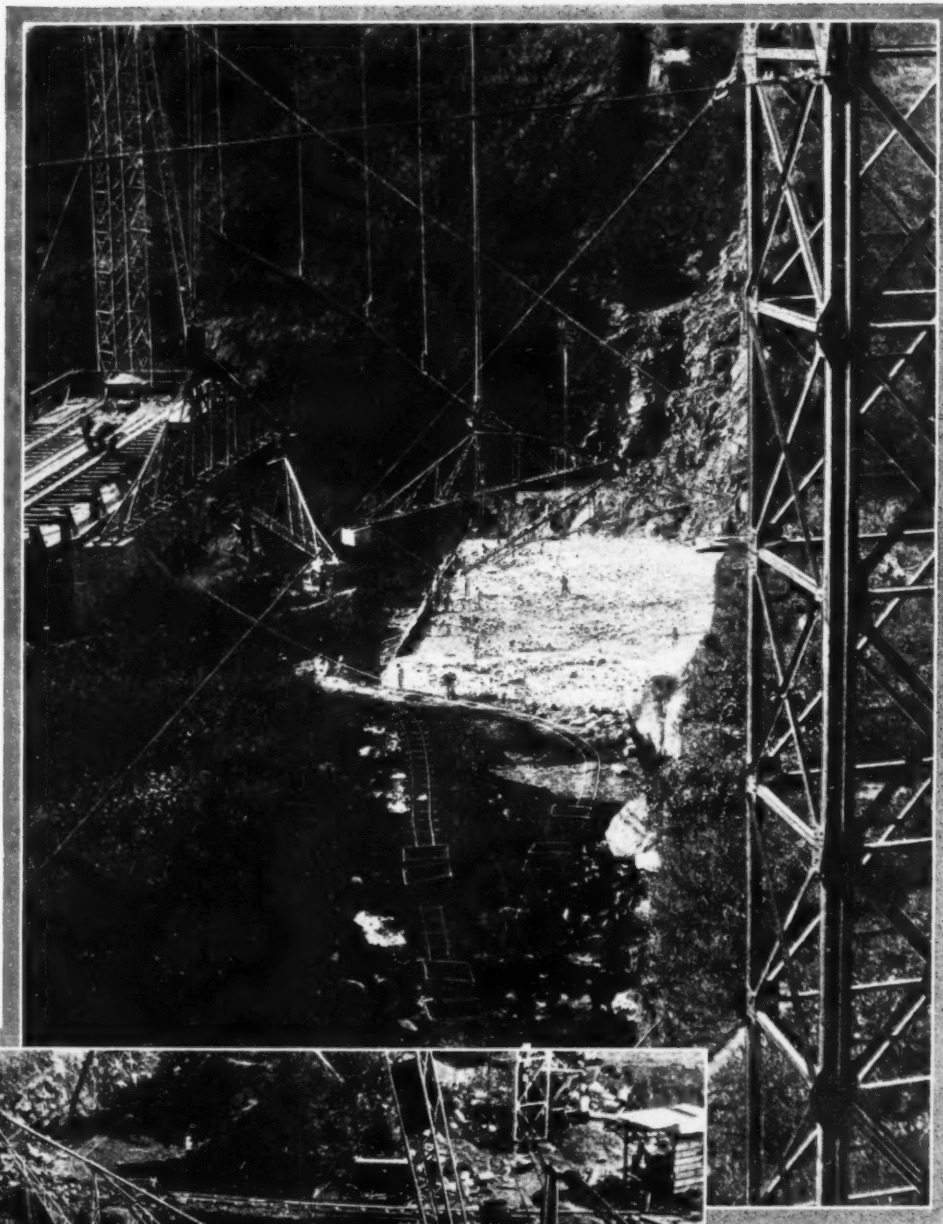


Pouring foundations. Crane lifts bucket filled with concrete from small truck



Concrete Work on Hermitage Dam in Jamaica, B.W.I.

A structure known as the Hermitage Dam is being built near Kingston, Jamaica, British West Indies, by Sir W. G. Armstrong Whitworth & Co. Ltd., of London. Considerable equipment manufactured in the United States is being used in connection with the concrete work. The steel chuting towers, one 200 ft. in height and two measuring 80 ft., were made by the Insley Manufacturing Company. The chute used is Insley 16-in. chute. As may be seen in both photographs, double counterweights were used in handling the chute and all concrete was placed with this equipment. The upper photograph shows the double counterweight units in action, and in the lower picture the pouring of concrete is shown at closer range.



The picture at the left shows concrete being poured on the downstream face of the dam

Building Modern Bridges

THE building of bridges, culverts and other drainage structures is an important part of the national highway construction program now under way in Mexico. The Mexican government is spending \$6,000,000 a year for improved highways, the funds for this purpose being raised by taxes on gasoline and tobacco.

Many of the new highways follow the general lines of old Spanish roads, and on these old roads the bridges are often too narrow or light for modern traffic. This has made necessary an extensive bridge building program. On the other hand, many of the old bridges are in excellent condition, and some of the new roads have been located so as to make use of them. Several of these old bridges just outside of Mexico City on the Puebla Road, are carrying modern truck traffic although they were built about 1740.

In the great majority of cases, however, there were no bridges at all over numerous streams, fords taking care of the traffic. Although these fords were satisfactory for the burros, they did not find favor with the owners of motor cars and trucks.

In planning for the construction of highway bridges, it was decided to build reinforced concrete structures in many

New and Up-to-date Structures Will Replace Fords and Old Masonry Culverts Which Are Not Suited to Needs of Motorized Traffic

cases. Standard plans were drawn up for these bridges modeled after the North Carolina standard plans. As practically all of the foremen and workmen had had no experience in this work, the engineers in charge had to be very careful in superintending the setting up of the forms and the pouring of the concrete.

The photographs which accompany this article were sent to *Successful Construction Methods* by P. K. Schuyler who went down to Mexico when the highway program got under way in 1925 and was employed as an engineer by the Mexican Highway Commission. He is now with the United States Bureau of Public Roads.

This neatly constructed masonry is typical of the work being done in Mexico



Placing the reinforcing for the concrete slab of the masonry culvert shown above

es

on Mexican Highway System

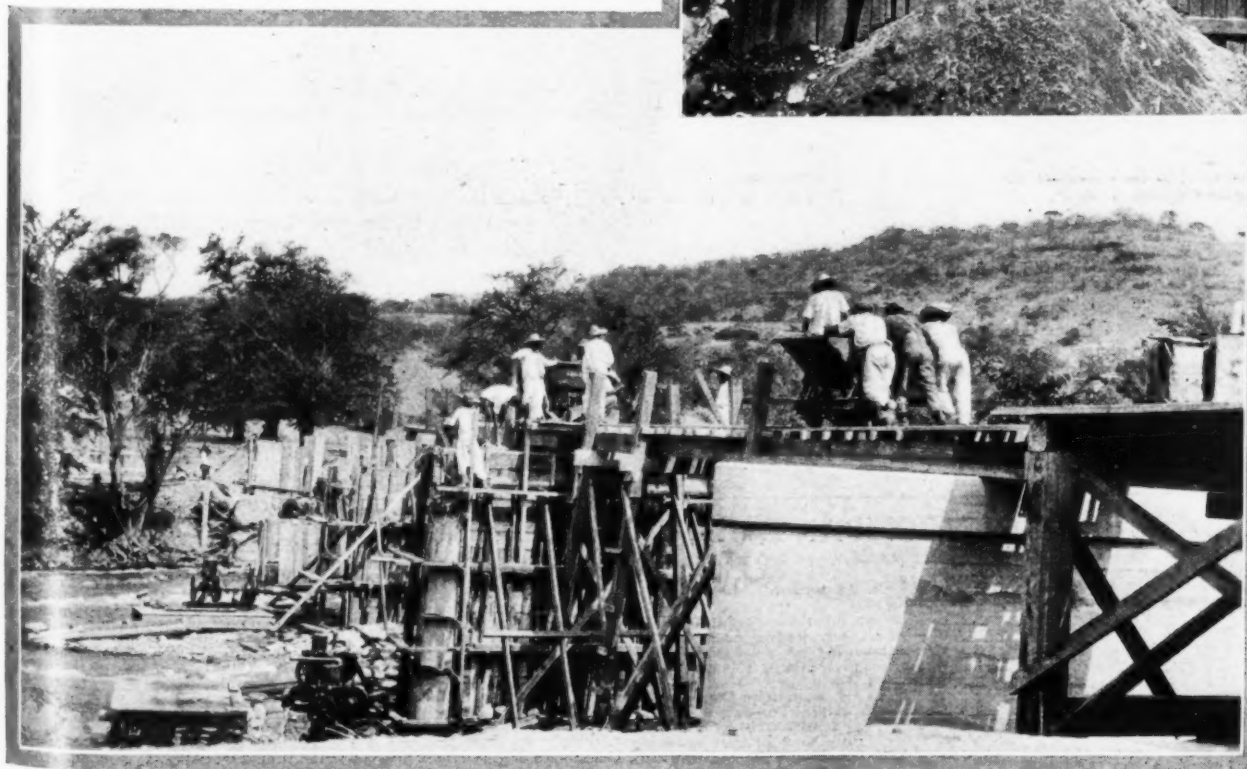
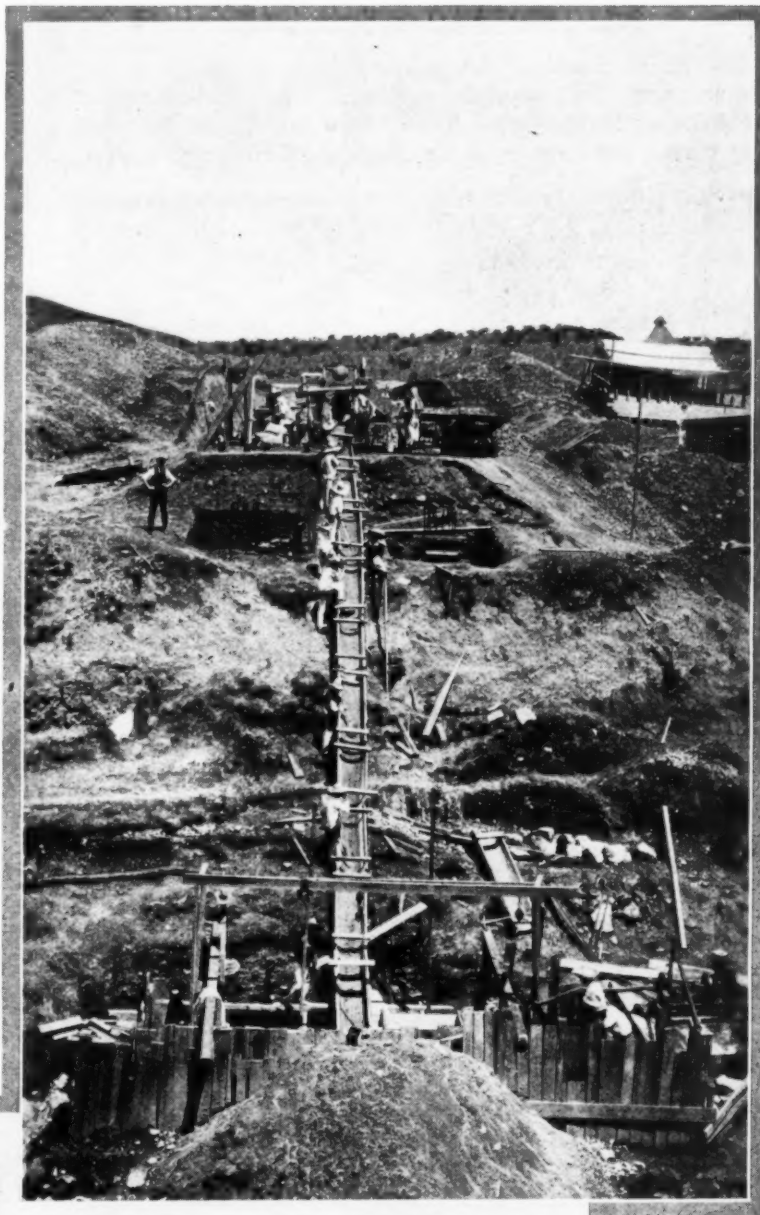
The two photographs on this page show work on a double masonry culvert with a reinforced concrete slab. Mr. Schuyler points out the accuracy with which the reinforcing steel was set despite the fact that the men handling the work were comparatively inexperienced.

The photographs on the opposite page show work on two bridges on the Federal Highway system. The upper picture shows the method of chuting concrete into the footing of a pier for a high bridge over a stream. The mixer was placed on the highway grade and the concrete chuted directly into the forms in the bottom of the valley.

In the lower photograph industrial cars are being used to carry the concrete from the mixer to the forms during the construction of a reinforced concrete bridge.

All of these photographs are typical of the bridge work now going on under the direction of the Mexican Federal Highway Commission. Despite the inexperienced labor, the work is being done in efficient fashion, and the new structures compare more than favorably with similar structures in the United States.

These two photographs show concrete work on Mexican highway bridges. The upper picture shows the method used in chuting concrete into the footing for the pier of a high bridge across a deep valley. The lower photograph shows a reinforced concrete bridge under construction. Industrial cars were used to convey the concrete from the mixer to the forms



NEW EQUIPMENT ON THE JOB

Maine Maintenance

The Maine Highway Department is using in its maintenance work some specially equipped Wehr graders which are doing excellent work. A truck body is mounted over the rear wheels and carries all sorts of equipment and supplies



used in maintenance work. A tool box mounted on the front of the chassis can be reached easily. The Maine Highway Department is using a fleet of these machines in various parts of the state.

A Gas or Electric Shovel

The new Osgood 11-yd. gas or electric shovel is now at work on a large number of construction jobs in various sec-



tions of the country. The machine shown in the photograph also performs as a crane with hook block or clamshell bucket

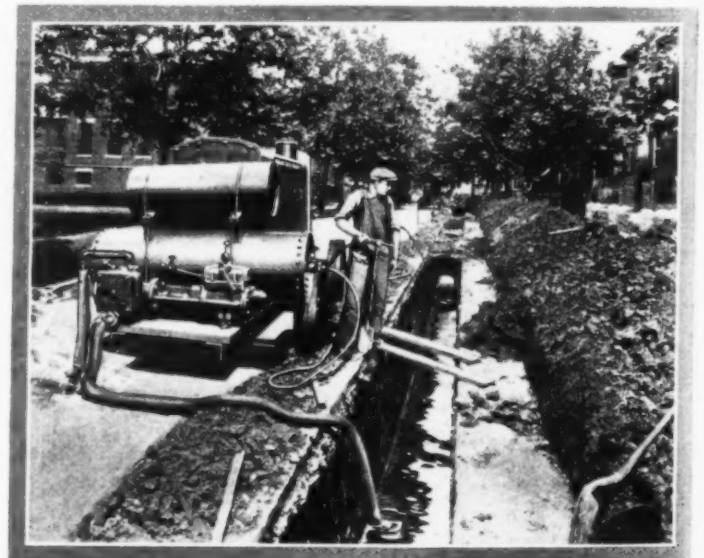
and as a dragline excavator. The only changes needed are in the booms and buckets.

This shovel is mounted as standard on an enclosed gear drive continuous tread truck of simple and rugged design. The chief features of construction are the all-gear drive with enclosed gears running in heavy oil; large supporting area of tread belts, steering from the upper body, in any position, with ability to turn gradually or on the machine's own center axis, and an underside clearance of twelve inches.

The shovel crowding is accomplished by a very simple wire rope mechanism which is self-adjusting to all boom angles and involves no chains or other complications.

Compressor Carries Pump

The Ingersoll-Rand Company is now turning out portable compressors with a pump attachment. This pump is placed at the rear of the compressor, as shown in the accompanying photograph and has proved its value in a number of opera-



tions. In the photograph it is shown pumping the water accumulated by a night's rainfall out of a ditch so that the men employed on the job can get to work with their air tools. A pump often is needed on work such as this, and the Ingersoll-Rand attachment fills this need.

The pump is operated by compressed air generated by the portable compressor to which it is attached, thus providing a complete self-contained unit. All that is necessary is to throw the suction hose into the ditch or excavation, start the compressor, direct the air to the pump, and in a short time the workmen have a dry comfortable working place.

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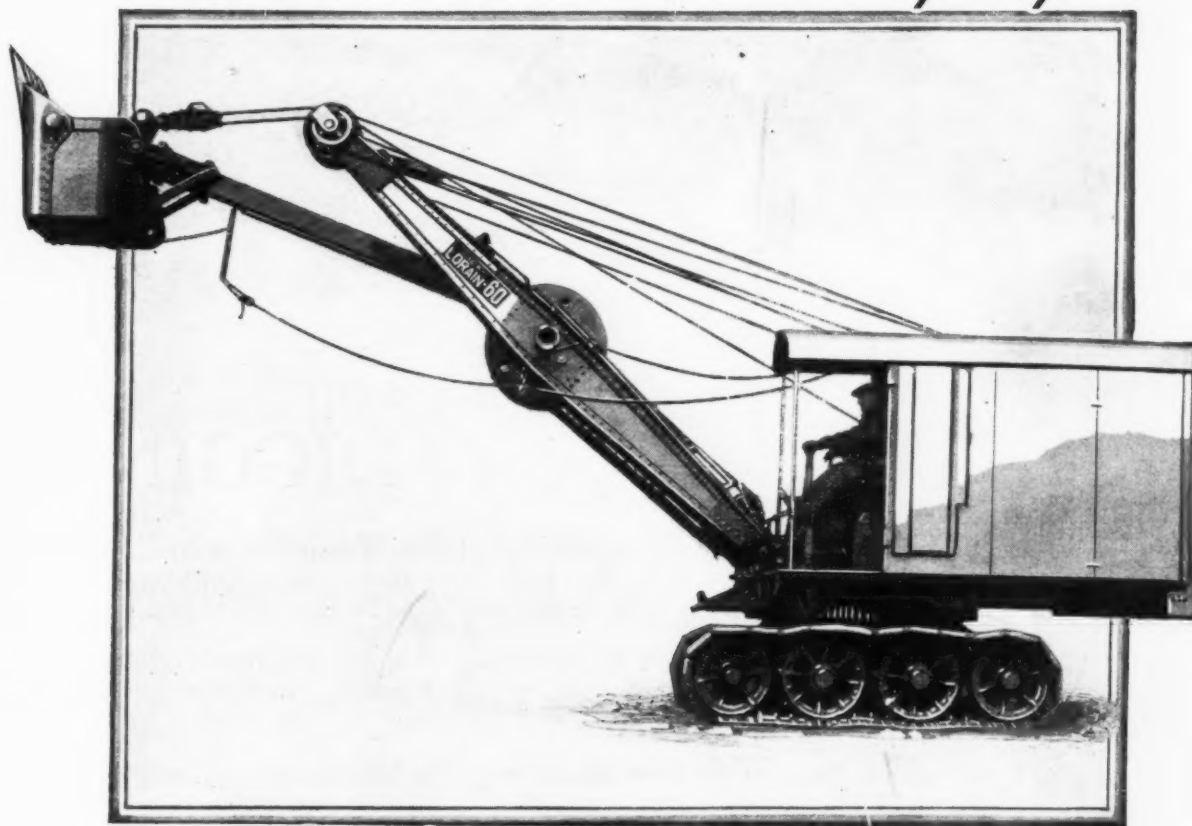
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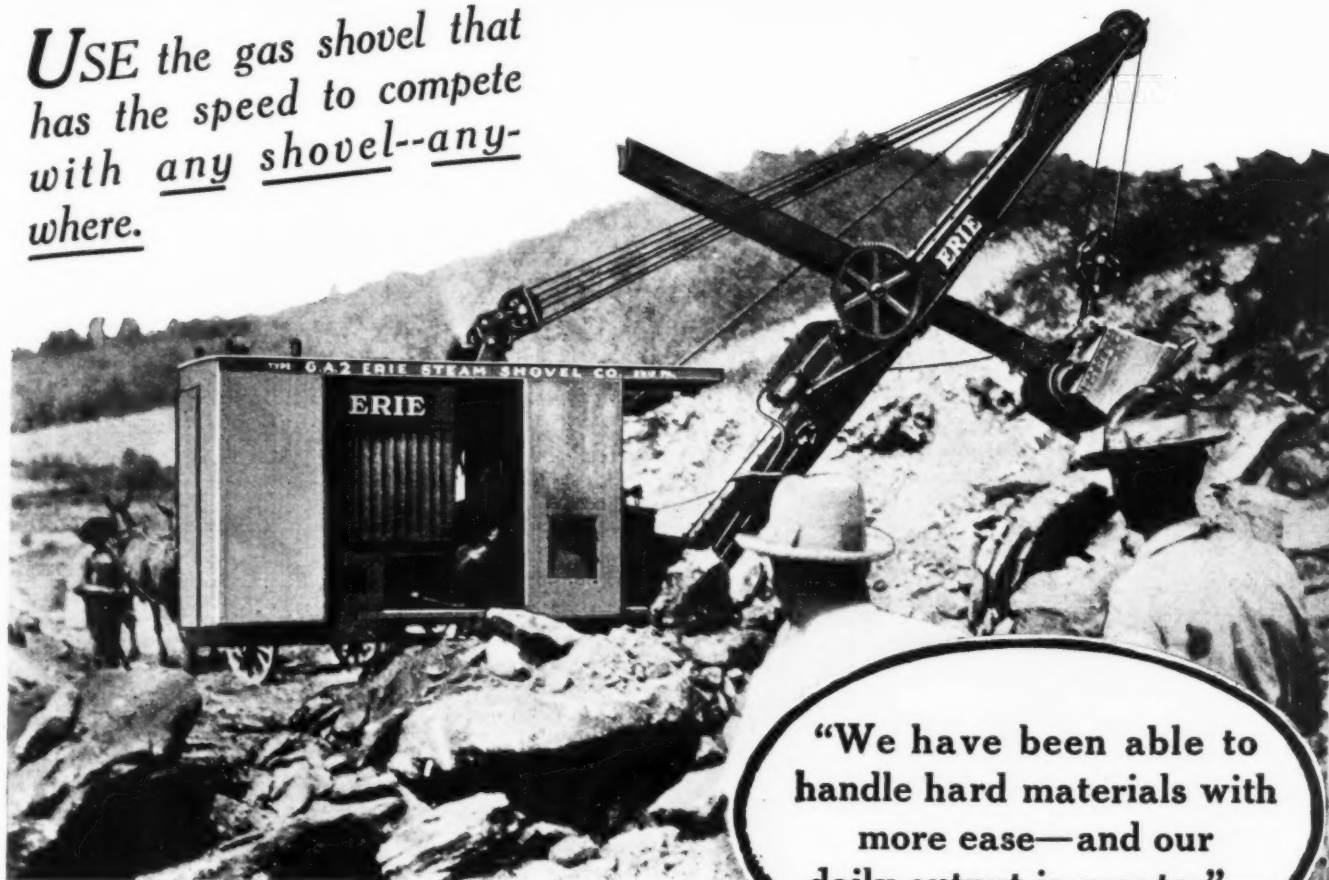
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This rock cut is the kind of digging that many contractors have kept their Gas+Air ERIES in, month after month—

Work that has shown the remarkable *power, speed and vitality* of this 3-engine gas shovel. This owner writes:

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in action. Our engineer is a very experienced man and he says it is the best shovel he has ever seen."

—W. E. Graham, Mt. Ulla, N. C.

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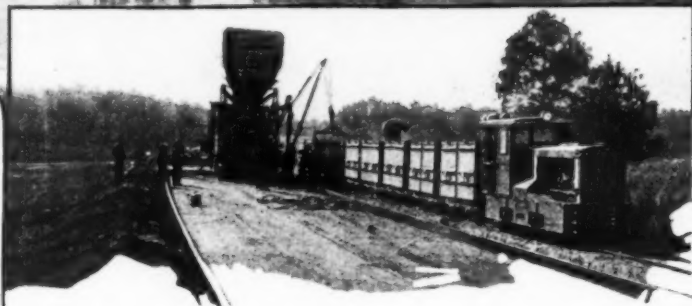
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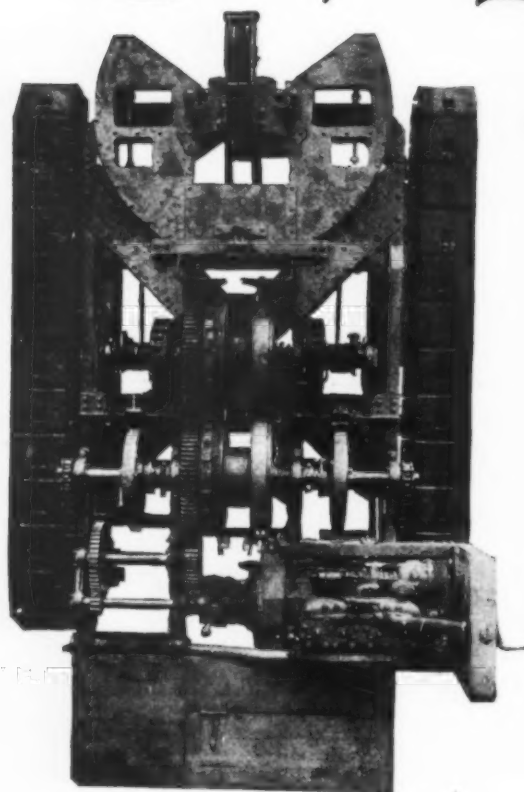
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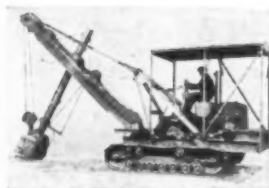
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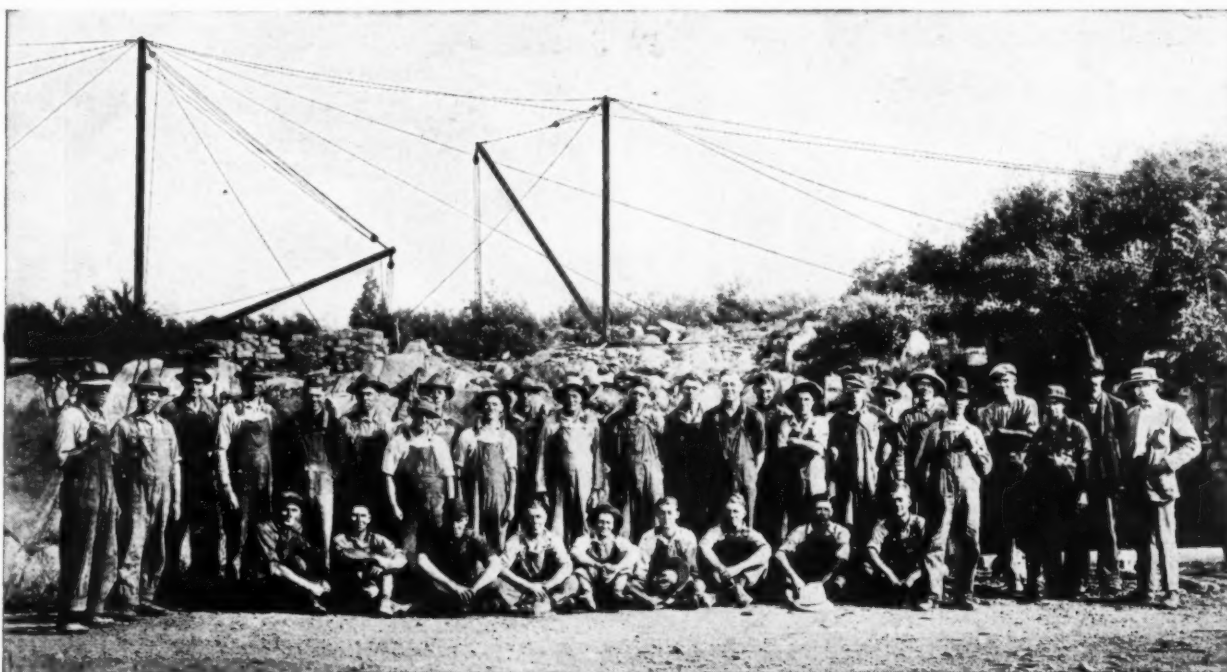
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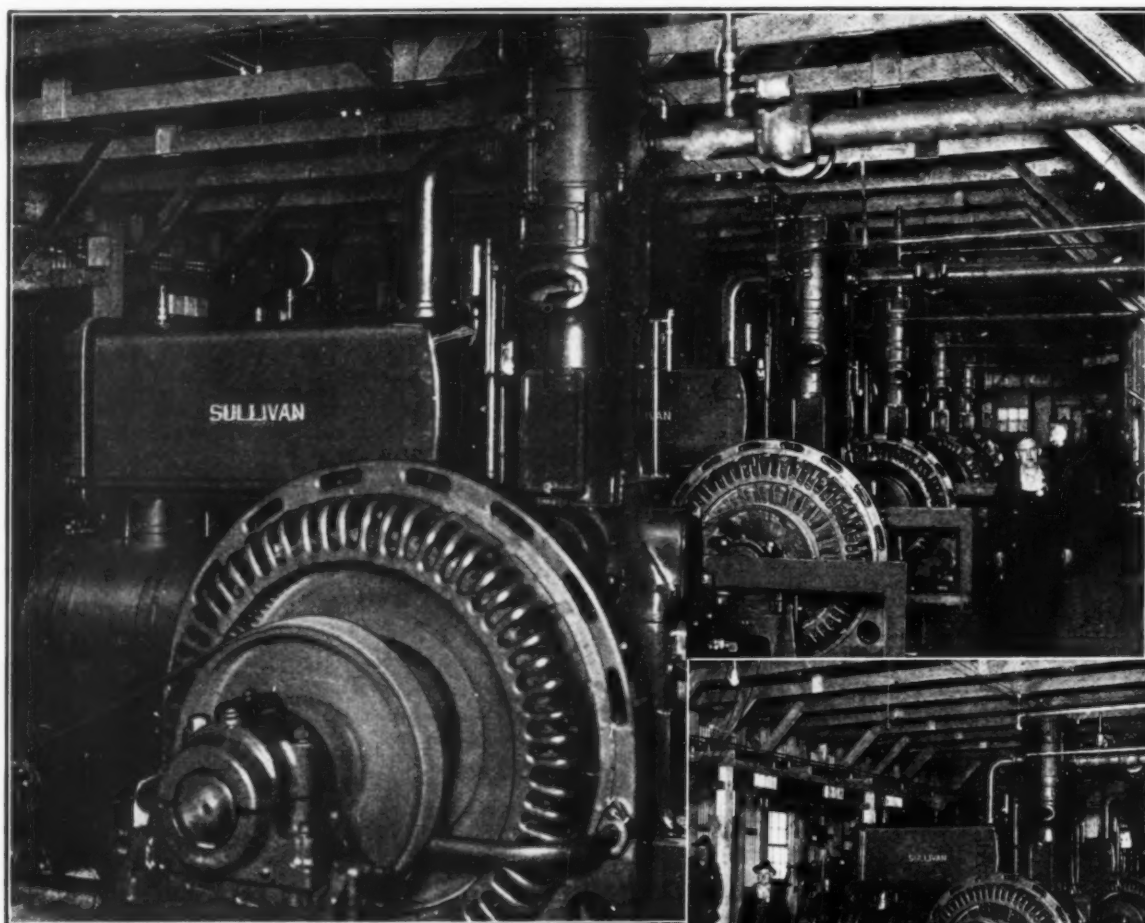
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Breaking Records in The Cascade Tunnel

Guthrie & Company of St. Paul, who are driving the 8-mile Great Northern Railway tunnel between Scenic and Berne, in the Cascade Mountains, broke the world's record three times last fall.

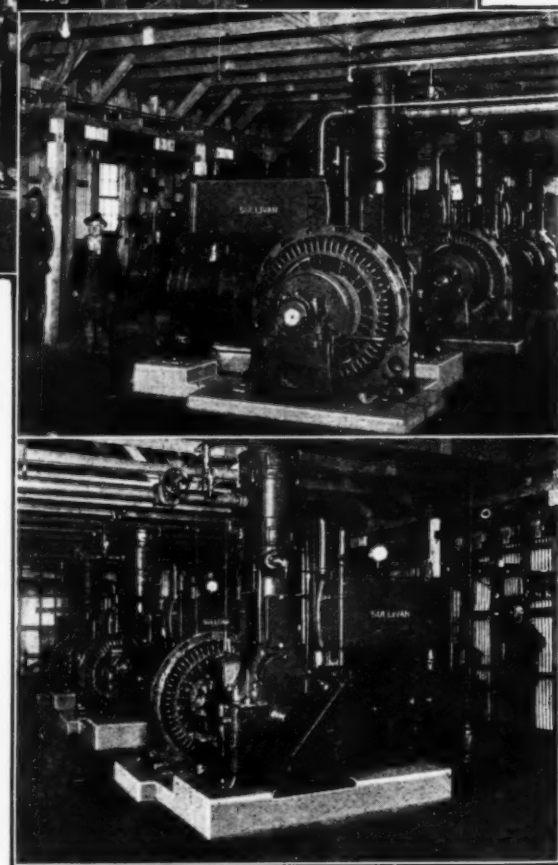
August (West Portal) 937 ft.
September (East Portal) 984 ft.
October (West Portal) 1157 ft.

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Sullivan Angle Compound Air Compressors did their part to make these records possible by furnishing a constant supply of air power for the rock drills in both headings.

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These compressors also supply air for four power shovels used in enlarging the tunnel to full size, and for the six Sullivan Drill Sharpeners. They have given continuous, economical service ever since they were installed.



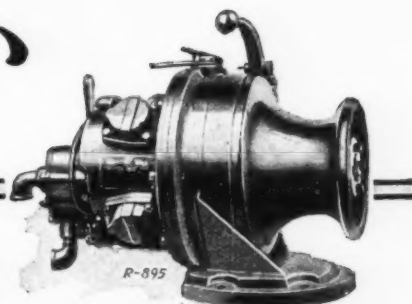
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for use with

Portable Air Compressors

These are new air hoists designed particularly for use with portable air compressors. They are compact, powerful and low in air consumption. They can be mounted almost anywhere—fastened to the compressor, or mounted on a pole or wherever is most convenient.

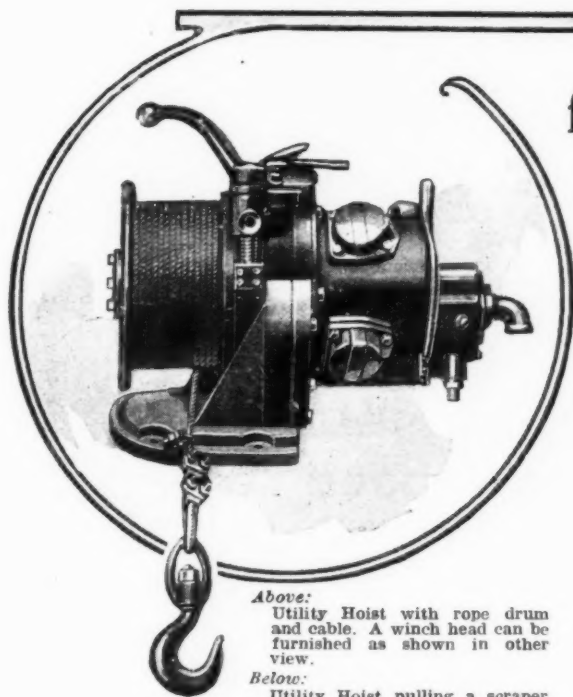
Utility Hoists save time and labor in hoisting and lowering material on construction work, handling pipes in gas or water main work, pulling scrapers in backfilling trenches, pulling and lifting rock in excavation work, skidding pipes, timbers, etc.—in fact wherever there is hoisting or pulling work to be done.

Ask for complete information on these new labor aiding hoists. They are made in three sizes—capacity up to 1500 lbs. or with the use of block and tackle the capacity can be multiplied many times depending on the number of strands of cable used.

INGERSOLL-RAND COMPANY, 11 BROADWAY, NEW YORK CITY

Offices in principal cities the world over

Canadian Ingersoll-Rand Co. Limited, 260 St. James Street, Montreal, Quebec.



Above:
Utility Hoist with rope drum and cable. A winch head can be furnished as shown in other view.

Below:
Utility Hoist pulling a scraper on backfill work. Hoist operated from I-R portable compressor.



23058

Ingersoll-Rand

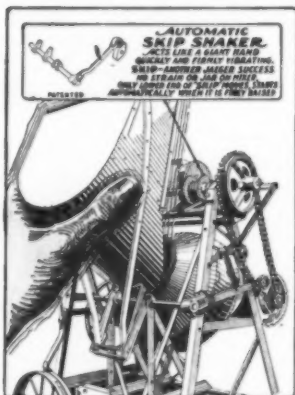
79-PC



Jaeger
ALTERS

AUTOMATIC POWER LOADER

Ask about the lightweight one bag Jaeger, with Leroi engine—Loader and tank at an amazingly low price.



**JAEGER'S
LATEST
SUCCESS**

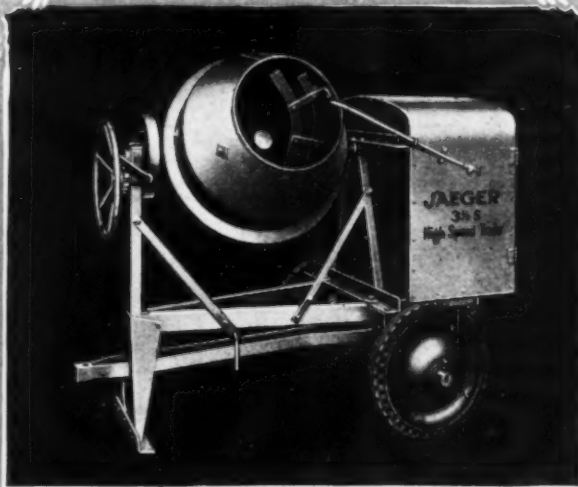
AUTOMATIC "SKIP SHAKER"

Ferro Concrete Construction Company, Cincinnati, O., says: "We have had 12 outfits with Shaker—Won't use anything else."

JAEGER IS THE WORLD'S LARGEST SELLING MIXER

The wonderful success is due to speed—patented "Re"mixing action of drum—Semi-automatic discharge. Patented measuring "tip over" water tank—steel construction.

Built in 1/2 to 4 bag sizes, 36 models



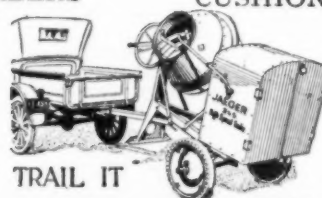
Jaeger
ALTERS

High Speed Trailers

BUILT FOR FAST HAULS
OVER BAD ROADS

AUXILIARY
SPRING
SHOCK
ABSORBERS

DISC WHEELS
ROLLER
BEARING
CUSHION TIRES



TRAIL IT

The Handy Mixer

Just right size for the small jobs—will pour average house foundation in a day—Mixes mortar as well as concrete.

\$190.00
NET
CASH
FACTORY

Buys complete Jaeger Trailer with dependable power—Roller bearing steel wheels—Spring shock absorbers—(Cushion tires slightly more.)

GET OUR NEW CATALOG—PRICES AND CONVENIENT TERMS

THE JAEGER MACHINE COMPANY

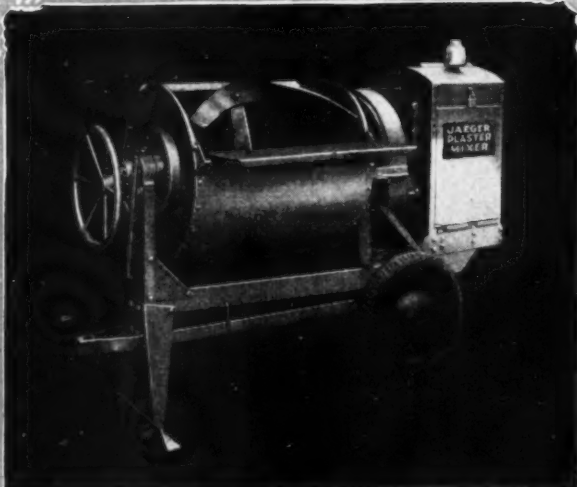
800 DUBLIN AVENUE

COLUMBUS, OHIO.

Branch Offices and Warehouses in all the Principal Cities.



JAEGER

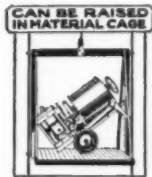


JAEGER PLASTER MIXER

Self Cleaning Hoe Type

Cuts Mixing Costs in Half

Brick mortar, patent hardwall or lime plaster (with any amount of fibre) sand or cement finish, magnesite or stucco.



JAEGER MIXED MUD SPREADS FASTER UNDER THE TROWEL

Means more daily output on highest priced labor—no mixing on the hawk—no lumps.

Make Stronger Plaster—Use More Sand

A better plaster mixer with 5 h. p. Leroi engine—heat treated steel reducing gears running in oil—built in clutch—renewable steel plate drum sheet—Jaeger non-leak Journal bearings.

GET OUR NEW CATALOG—PRICES AND CONVENIENT TERMS

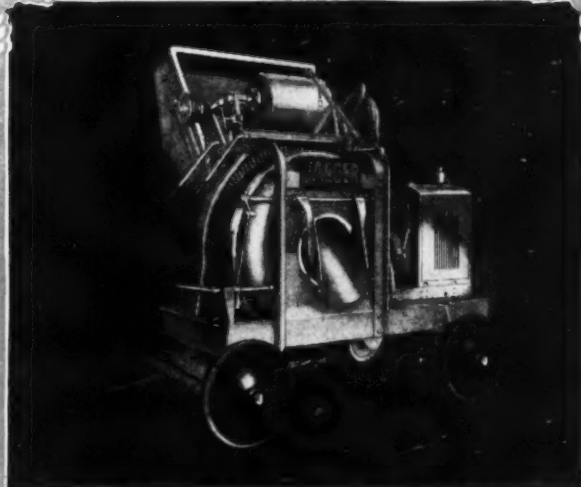
THE JAEGER MACHINE COMPANY

800 DUBLIN AVENUE,

COLUMBUS, OHIO.

100 Jaeger Service Stations and Distributors—No delays.

MIXERS



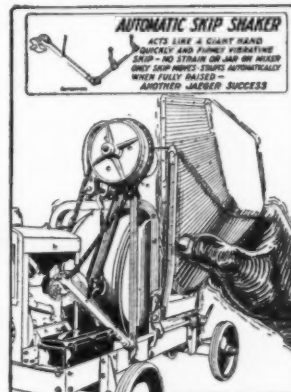
JAEGER NON-TILT MIXER

ALL STEEL—100% ROLLER BEARING
DIRECT DRIVE—NO COUNTER SHAFT.
CRISS-CROSS MIXING ACTION
FASTER DISCHARGING
HALF-TON LIGHTER—50% STRONGER

**NO MORE
POUNDING
ON LOADING
SKIPS!!**

JAEGER'S AUTOMATIC SKIP SHAKER

Starts vibrating when skip is fully raised—No clogging—faster charging.



JAEGER'S 10-S TWO BAGGER AT ONE BAG WEIGHT AND PRICE

Built in low charging or power loading models.

FOUR HEAVY DUTY SIZES

10S 14S 21S 28S

WRITE
FOR
CATALOG

Building Profits as Well as Bridges

ALL jobs are alike to a Browning Locomotive Crane. It doesn't make a particle of difference whether they are helping in the erection of a new structure, handling coal, working around an industrial plant or steel mill or on scrap-handling duty—Brownings save money in material handling on them all.

Such construction features as independent rotating engines, perfected locomotive crane boiler, one-piece rotating base, riveted construction, centralized control and vertical reversible engines assure maximum operating efficiency with minimum upkeep.

On the construction of the *Pennsylvania bridge over Becks Run at Pittsburgh, Pa.* (M. J. McMenamin, contractor) the Browning vertical engine feature was a decided factor in favor of the Browning. The vertical engine eliminates all lateral vibration.

For full information why Brownings work harder and last longer—write the home office or any branch.

THE BROWNING CRANE COMPANY

16226 Waterloo Road
CLEVELAND, OHIO, U. S. A.

New York Philadelphia Chicago
Pittsburgh Birmingham St. Louis

Sales Agents:
Portland Los Angeles San Francisco
Montreal London, England



BROWNING

LOCOMOTIVE CRANES AND BUCKETS

Put These Workers On Your Payroll— They WORK!

The Link-Belt "GRIZZLY" Loader

The Grizzly Super-capacity Crawler Loader will supply materials fast enough to keep any mixer busy. The rapid batching and accurate strike-off is a feature of operation that makes the "Grizzly" most useful for road building. Ask for Book No. 924.

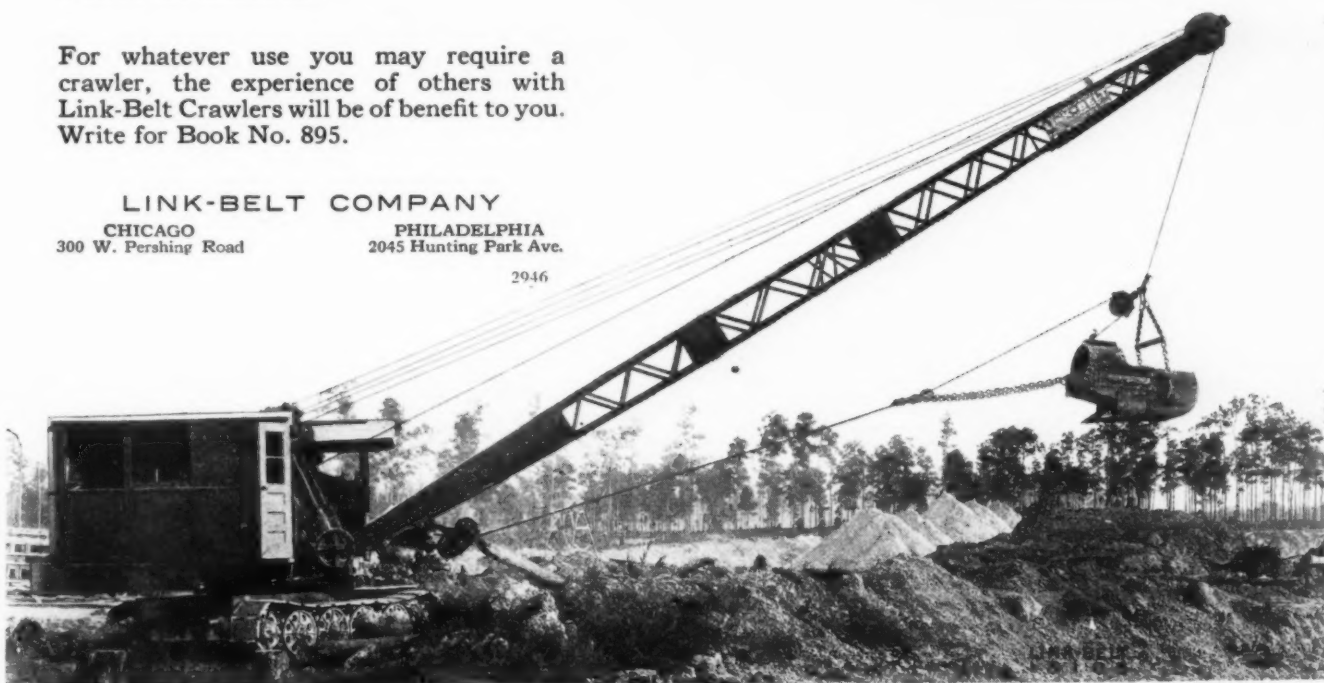
The Link-Belt "Built for Service" CRAWLER

A Crawler of Record Performance.

In Florida a Link-Belt Crawler on work "hard enough to dynamite—digs thru"; in Illinois another Link-Belt Crawler—"mired to the top of its lower frame—pulls out"; in Indiana a Link-Belt Crawler saves \$5000.00 on its first job—and so it goes, wherever Link-Belt Crawlers are used—records are shattered.

For whatever use you may require a crawler, the experience of others with Link-Belt Crawlers will be of benefit to you. Write for Book No. 895.

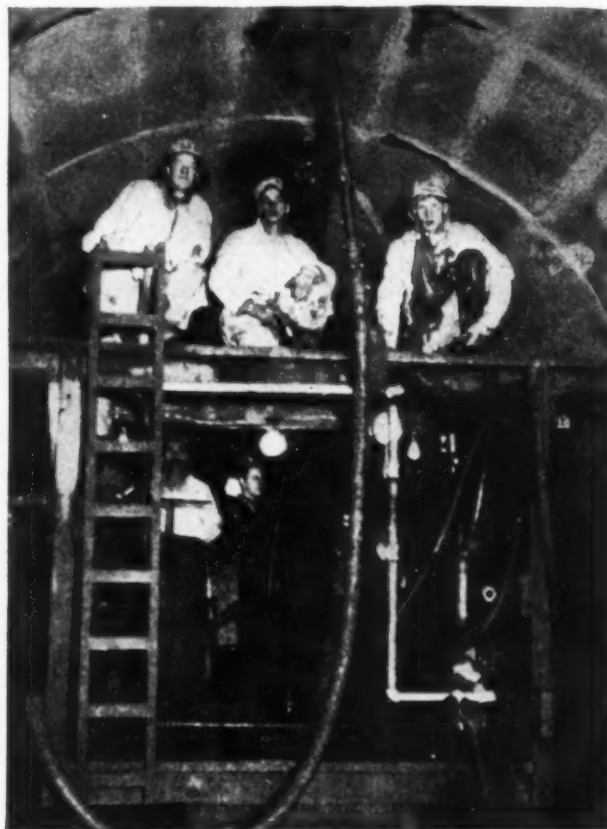
LINK-BELT COMPANY
CHICAGO PHILADELPHIA
300 W. Pershing Road 2045 Hunting Park Ave.
2946



LINK-BELT



For Work Like This A Ransome Pneumatic Grout Mixer and Placer Is the only thing



Grouting Catskill Aqueduct

In actual practice, Pneumatic Grouting is a simple operation and requires little skill, and the cost of the equipment, outside of the air compressor, which is very apt to be found on the job where grouting is required, is exceedingly small.

To seal the fissures, rifts, etc., in tunnel work and check the flow of water, the opening is closed by any convenient means except at the points where the discharge line from grout mixer is inserted. At these points grout is forced in under sufficient pressure to overcome the head and allowed to set up when the opening is closed permanently, and the

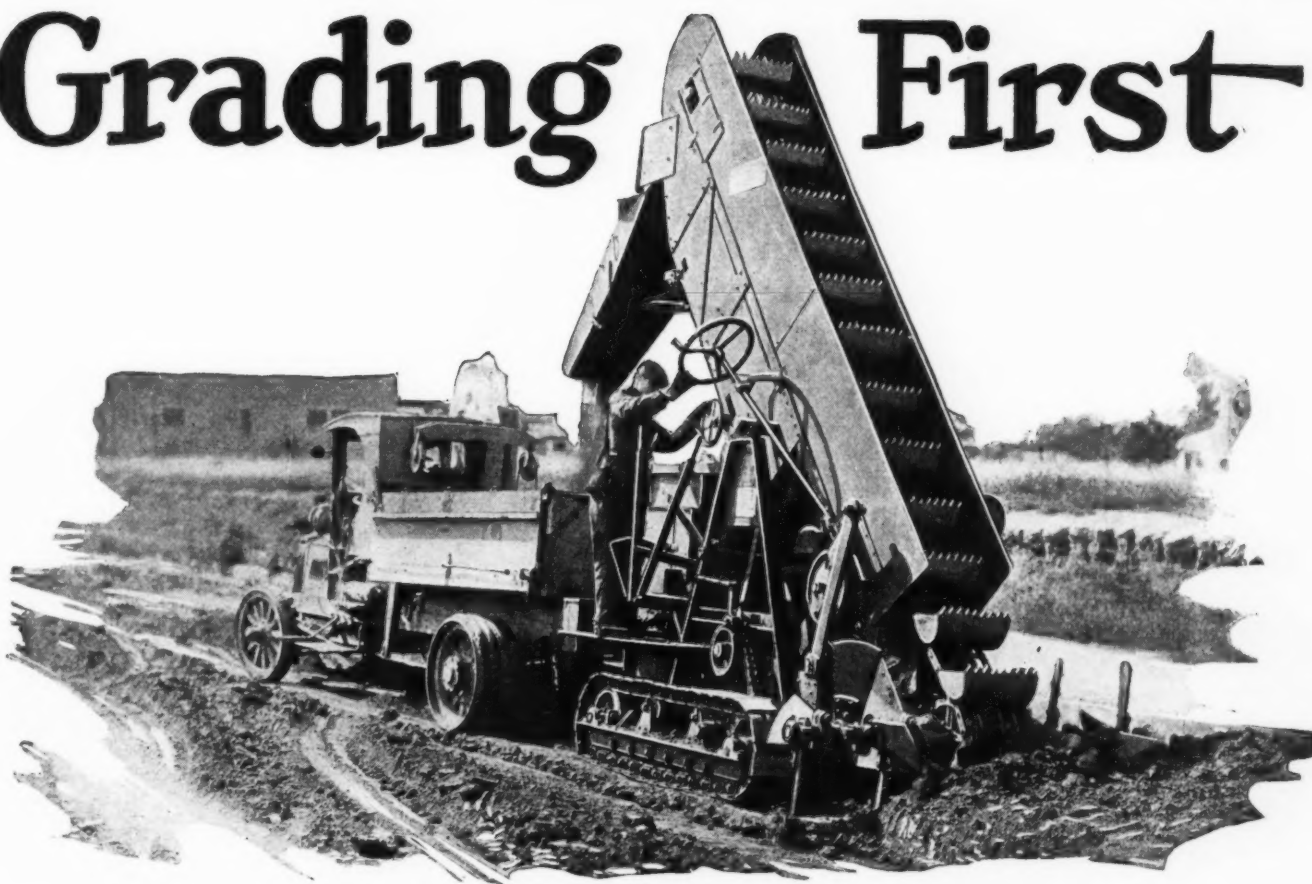
work can proceed without further interruption at this particular point. Ransome Pneumatic Grout Mixers and Placers are built in three types—Standard, High Pressure and Extra High Pressure, suitable for pressures up to 150 pounds, 300 pounds and 600 pounds respectively. The standard type is furnished on over 90% of the orders.

Give us the answers to the questions below and we'll tell you how you can use the Ransome Pneumatic Grout Mixer and Placer to advantage on your particular job.

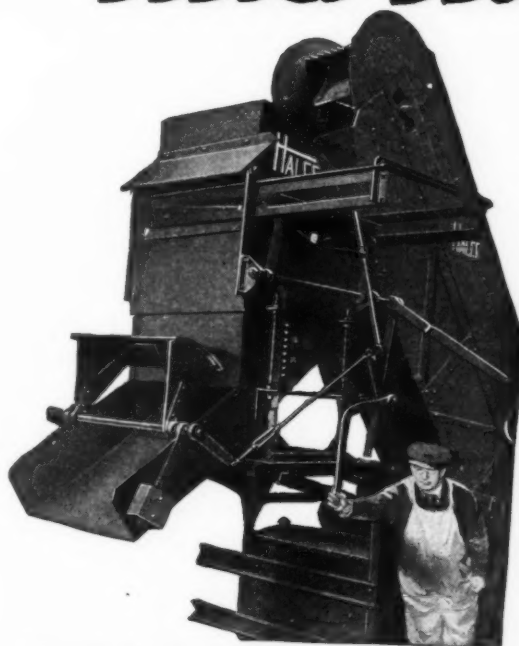
1. Is grouting to shut off water?
2. What is total head of water?
3. Estimated flow.....
4. If grouting in concreted tunnel give thickness of concrete.....; diameter of finished tunnel.....; distance between grout pipes.....; size of pipes.....; are pipes in place?.....; nature of material outside concrete.....
5. Is grouting to solidify loose rock?
6. Is grouting intended to fill voids in concrete only?
7. Air available..... cu. ft..... pressure
8. Send sketch giving all details possible, particularly dimensions.
Name of contractor or engineer.....
Address.....

Ransome Concrete Machinery Co.
Dunellen New Jersey

Grading First



And Then Batching



THE double-duty function of the Haiss Creeper Loader gives it first call on any paving contractor's preference. And because it has the power to wade into the heavy digging, it is the best machine for stockpile loading, too.

You can hold the grade with a Haiss Loader because the boom is rigidly pivoted to the chassis and is held at grade with the worm gear raising-and-lowering device. You can make a cut because the Haiss patented revolving paddles and slow-speed crowding drive, with a 37 H.P. Waukesha Engine back of them, stand right up to the job.

And the Haiss Precision Batch Hopper is the speediest and most easily operated thing of the kind, with micrometer accuracy and easy-acting strike-off.

*Stop and get acquainted at Space NC-23,
Chicago Road Show. Or write for Catalog
523 and Bulletin 126.*

Manufacturers of
THE GEORGE
--Truck and--
Wagon Loaders
Portable Belt
Conveyors

HAISS

139th Street and Rider Avenue, New York
Representatives Throughout the World.
Millars Timber & Trading Co., London, British Representative.
Cable Address "Coalhoist" New York—"Western Union 5 Letter Edition" Code.

Established 1892
MFG. CO. INC
Clam Shell
-- Buckets --
Mat'l Handling
Equipment.



1st cut

The first or plowing cut is made with the right rear wheel pulled in so that it is directly behind the toe of the blade, which in turn is behind the right front wheel. The left rear wheel is extended to avoid running in the loose dirt.

2nd cut

In making the second cut the position of the wheels is reversed, the right being extended to brace the machine against the bank while the left is pulled in to run behind the blade and avoid the loose dirt. The only way the operator of a long one-piece axle grader can avoid this loose dirt is by setting the blade at such a sharp angle that the furrow comes inside the left rear wheel, which obviously greatly reduces the amount of work done by his machine.



**Why?
Because
That's**

will an Austin TELESCOPIC AXLE Leaning Wheel Grader do more of any kind of work than other leaning wheel graders?

the Austin operator sets his blade first and his wheels afterwards, thereby working his machine to its full capacity; while the operator of a long one-piece axle grader must think of his wheels first and then set his blade accordingly, even if this results in his working the blade 'way below its capacity.

the Long and Short of it—

Please send me a copy of your new Austin Leaning Wheel Grader Catalog, "The Long and Short of it."

THE AUSTIN-WESTERN ROAD MACHINERY CO.

400 N. MICHIGAN AVE., CHICAGO, ILL., U.S.A.

Branches in all Principal Cities

Naturally—BLAW-KNOX

Steel Forms

were used on this unusual job

The STEEL FORMS and the Gantry Traveler which played such a major part in the dry-dock construction of the 12 segments for the Oakland-Alameda Estuary Tunnel—were designed and built by Blaw-Knox.

Thus—the California Bridge & Tunnel Company was relieved of one of the many unusual problems which were encountered on this great project.

Engineers and contractors the world over constantly seek the engineering advice and co-operation of Blaw-Knox on concreting jobs of every description.

BLAW-KNOX COMPANY

682 Farmers Bank Bldg.

PITTSBURGH, PA.

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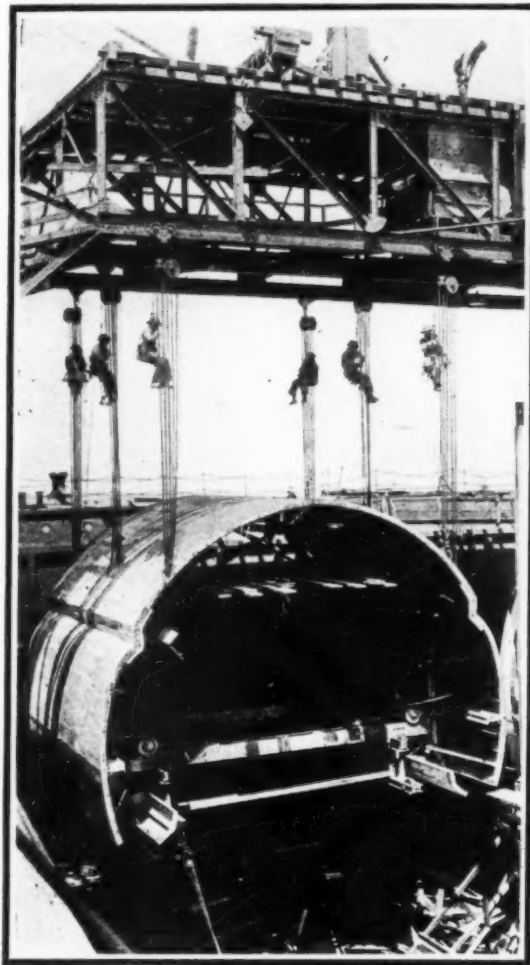
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Cleveland

Detroit

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STEEL FORMS

"Caterpillar" Tractors Keep Good Roads Good

Motorists, taxpayers and voters
are grateful to the Road Of-
ficial who keeps a "Cater-
pillar" at maintenance
work. It pays divi-
dends in com-
fort, speed
& safety
!

"Caterpillar" Tractor Prices

2-TON . . . \$1850
Peoria, Illinois

THIRTY . . . \$3000
Peoria or San Leandro

SIXTY . . . \$5000
Peoria or San Leandro

There is a "Caterpillar" dealer near you

CATERPILLAR TRACTOR CO.

Executive Offices:

San Leandro, California, U. S. A.

Sales Offices and Factories:

Peoria, Ill. San Leandro, California

New York Office:

50 Church Street

Successor to

BEST

C. L. Best Tractor Co.

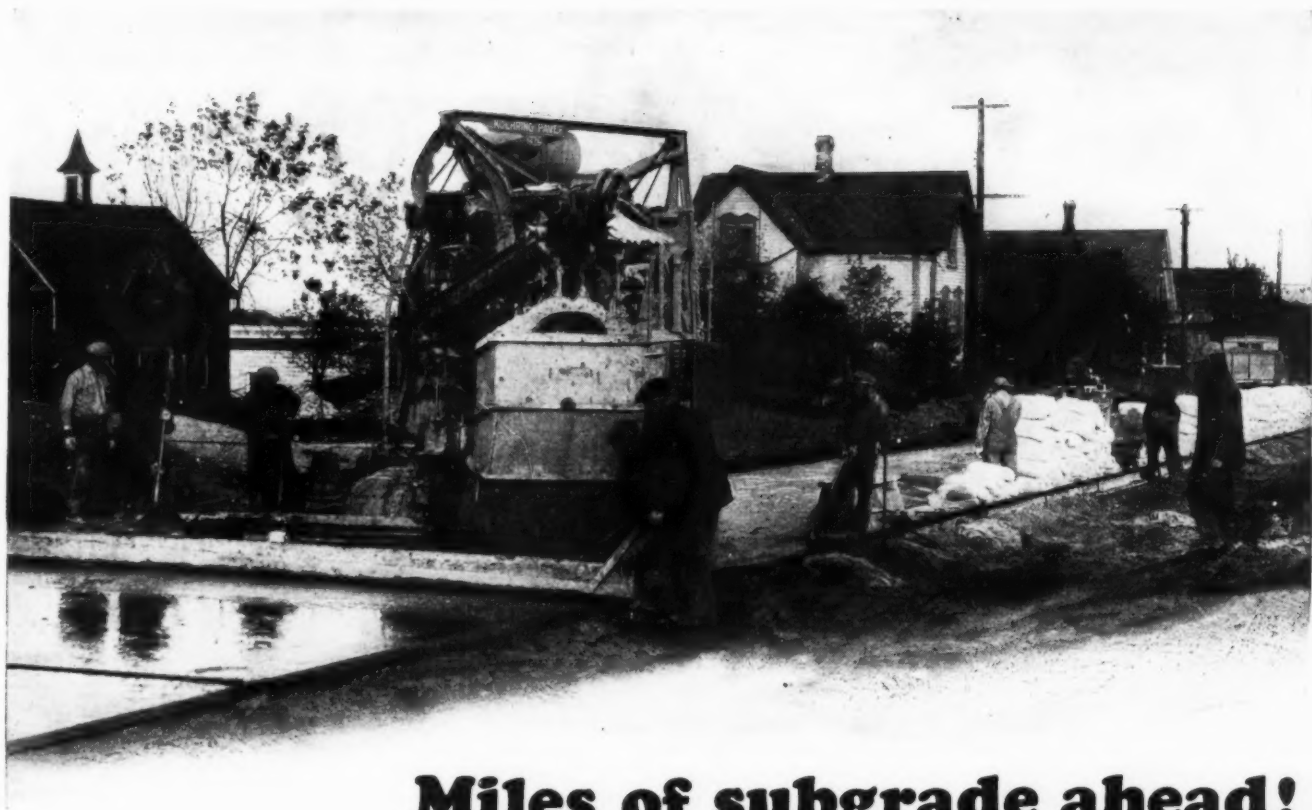
HOLT

The Holt Man-
ufacturing
Co.

CATERPILLAR

REG. U.S.

PAT. OFF.



Miles of subgrade ahead!

ON the job! Ready to go! The whole season's ahead, but it's made up of minutes! *Minutes are money* to you now!

Mixer performance — that's what you want NOW!

What a feeling of confidence if you haven't compromised on choosing your mixer!

—if you've bought your mixer on its *long, outstanding record of performance on thousands of miles of highway.*

— if it's the mixer that has demonstrated its extra yardage reliability in the hands of hundreds of most successful contractors!

Why — just a little extra yardage every day amounts to a big extra cash

profit at the season's end!

Besides — there's that feeling of security against costly delays and breakdown—that certainty that no matter what you ask in extra yardage from the Koehring you're not taking it out of the life of the mixer. The Koehring is built for *Record-makers!*

Extra-yardage performance
— *Heavy Duty Construction*
— that's the *Koehring!*

SIZES

Pavers—7-E, 13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A. G. C. Standards.

Construction Mixers—10-S, 14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A. G. C. Standards.

7-S Dandle Mixer — Two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A. G. C. Standards.

The Greater KOEHRING

Write for Paver Catalog No. P-17.

KOEHRING COMPANY

PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES
MILWAUKEE, WISCONSIN

Sales Offices and Service Warehouses in
all principal cities

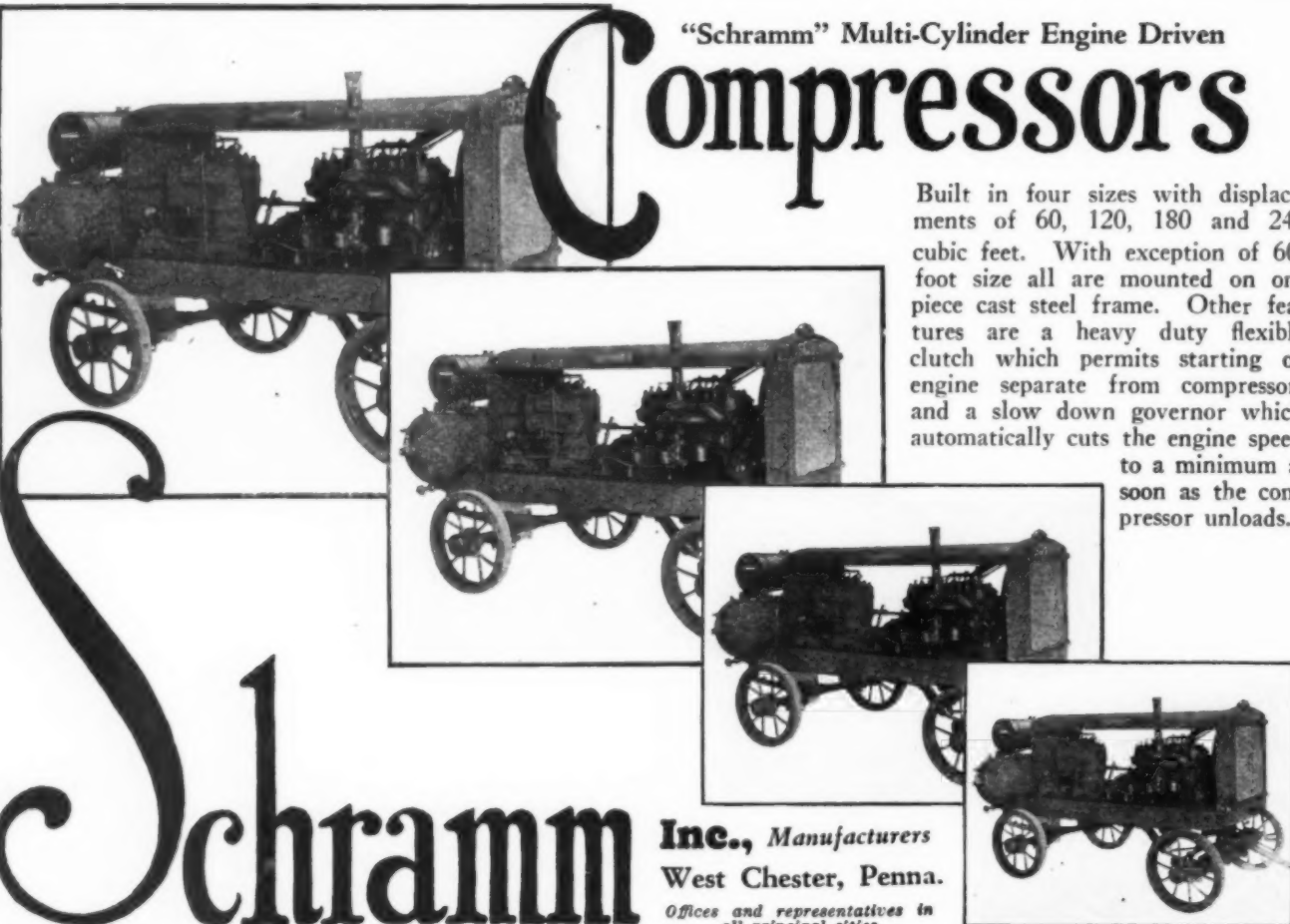
Foreign Department

Room 1370, 50 Church St., New York City
Mexico, F. S. Lapum, Cinco De Mayo 21,
Mexico, D. F.



A-3830-I

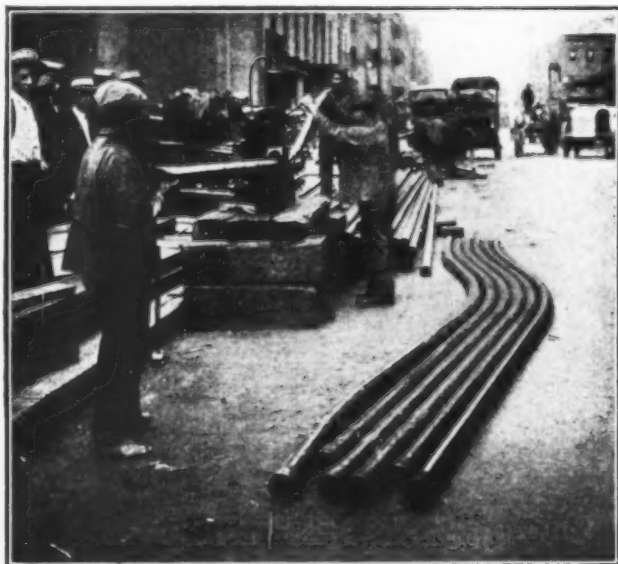
Schramm



"Schramm" Multi-Cylinder Engine Driven Compressors

Built in four sizes with displacements of 60, 120, 180 and 240 cubic feet. With exception of 60-foot size all are mounted on one piece cast steel frame. Other features are a heavy duty flexible clutch which permits starting of engine separate from compressor, and a slow down governor which automatically cuts the engine speed to a minimum as soon as the compressor unloads.

Inc., Manufacturers
West Chester, Penna.
Offices and representatives in all principal cities.



A Watson-Stillman Hydraulic Bender Bending Conduit Pipe for Subway Work. Note that but three men are needed in the crew.

The illustrations show one of our hydraulic pipe benders designed for bending pipe of various sizes. These machines are not only rapid and economical of labor, but the bends are made uniform and without danger of buckling or crushing.

THE WATSON-STILLMAN CO.,

1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd.
 Cleveland, Auditorium Garage Bldg.

Philadelphia, Widener Bldg.
 Detroit, 7752 Duboise St.

DO YOU BEND MUCH PIPE?

If you do you need a Watson-Stillman Hydraulic Pipe Bender

We build pipe benders in a variety of types and sizes as well as a full line of Hydraulic Machinery, including jacks, pumps, accumulators, presses, shears, etc.

Write for catalogs.



The New **ERIE** AggreMeter

Portable—Self Cleaning—Dependable

FOR handling and measuring materials in bins, the 1927 Erie AggreMeter Plant has advantages which make it the logical choice of contractors and supply dealers this year.

It is portable and easily erected—shipped assembled or semi-assembled depending upon the size. The sides are built on a sharp angle, free from any obstruction to retard flow of material.

The AggreMeter is fast and accurate,

and is operated entirely by one man. Its absolute dependability has won the endorsement of owners everywhere. Erie's many repeat customers indicate that the AggreMeter has made good, and that its sturdy construction stands the gaff of long, hard service.

You can get an Erie AggreMeter Plant in either volume or weighing type, 17 to 133 cu. yds. capacity. Measuring devices sold separately when desired.

Send coupon for new AggreMeter Bulletin

ERIE STEEL CONSTRUCTION CO., ERIE, PENNA.

1927 Portable Model

This illustration shows the New Type F AggreMeter Plant, built in 57 and 85 cu. yds. capacity. Very popular for road work, central mixing plants, etc. Easy to ship and erect—simply hoist the bin with crane, and bolt the measuring devices and legs in place.



Erie Buckets

FOR digging or handling materials, you will find the Erie Bucket designed for the job will give you the kind of service that means real profit to you.

The extraordinary digging power and durability of Erie Buckets is explained by the superiority of the Erie power-arm design, and of Erie all steel construction. The Erie Bucket will outdig, and we believe outlast any other bucket of equal weight.

Please send for full information



The Erie Steel Construction Co. • Erie, Penna.
 You may send me information on
☐ AggreMeter Plants for
☐ Buckets for
 Name _____
 Address _____
 Town _____
 State _____
 SM-2-27

Mose knows

It happened on a construction job in St. Louis.

The Superintendent stopped to enquire about the Cleveland C6 Paving Breaker.

The Superintendent:—"Mose, do you get lots of work with the Cleveland breaker?"

Mose:—"Well, Boss, I ain't much for the 'lots o' work' stuff, but dis baby sho is easy on my arms, an' I jus' matchelly runs away from de niggers with the other breakers!"

Then the Superintendent found that the boys were fighting every morning to see who would use the Cleveland C6 that day, and he ordered four! Now they're all getting out "lots of work."

*Write for Bulletins on
Cleveland Air Tools.*

The Cleveland Rock Drill Co.
3734 East 78th Street, Cleveland, Ohio

Chicago, Ill., 608 S. Dearborn St.

Detroit, Mich., 428 Insurance Exchange Bldg.

New York City, 30 Church St.

St. Louis, Mo., 2091 Railway Exchange Bldg.

Philadelphia, Pa., The Bourse Bldg.

Birmingham, Ala., 403 N. 24th St., Box 2028.

Pittsburgh, Pa., 922 Farmers Bank Bldg.

Negaunee, Mich., 222 Heath St.

British Representative: John MacDonald & Company, Pollokshaws, Glasgow, Scotland.

CLEVELAND ROCK DRILLS



EASTON "FORTY" TRAILER

\$250.00

f.o.b. EASTON, Pa.

These Trailers are all-steel construction—they are designed to be hauled by any standard make of tractor. When so drawn they deliver an average of 130 to 150 cubic yards of material per day over a haul of 1000 feet—equal to one large truck or three teams. The saving? About \$10.00 per day.

EASTON CAR AND CONSTRUCTION COMPANY, EASTON, PA.

ONLY THE BARBER-GREENE HAS THE DISC-FEED AND FLOATING BOOM



Straight Into the Pile *with the disc-feed*

The two smooth, flat, revolving discs of the Barber-Greene Disc-Feed slide into and under the pile—like two shiny scoop-shovels. Revolving inwardly, they pull the material into the buckets—assuring each a heaping load.

The discs don't try to beat the material down—they don't make the buckets dig—they can't jam—and they're not dangerous, even to men working on the same pile.

With this feed—the "25" and "42" stand ready to handle any loading job, no matter how large or small.

BARBER-GREENE COMPANY
530 W. PARK AVE. AURORA, ILLINOIS



Barber-Greene Loaders

Representatives in 50 Cities
DISC FEED LOADERS VERTICAL BOOM DITCHERS
STANDARDIZED PORTABLE AND PERMANENT BELT CONVEYORS
SNOW LOADERS CAR UNLOADERS COAL LOADERS

A Free Tour of Layouts

If you would like to take a tour of material loading layouts, to see how others load and batch their aggregates, send for a copy of "Loading Layouts." It doesn't contain many words—but it is filled with pictures, layouts, and information on interesting jobs which Barber-Greene men have run across during the past year.

Send for a copy today—this coupon brings it, without obligation.

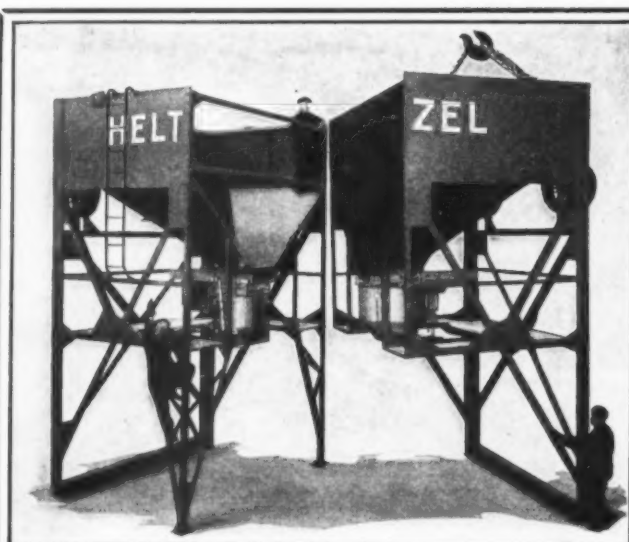
BARBER-GREENE COMPANY
530 W. Park Ave., Aurora, Ill.

Name.....

Address.....

City.....

State.....



Simply Bolt Halves Together And Remove Temporary Legs

80-105 Ton Trailer Bins

Large capacity bins will now come into general use. Your work will be speeded up with fewer operators and lower costs.

Because HELTZEL 80 and 105 Ton Twin Trailer Bins are dismantled, removed and set up for operation in considerably less time and less cost than other makes of bins one-third the size. Only 40 bolts in assembling and shelf angle on each temporary leg instantly aligns bolt holes of two halves.

Removed from one set up to another in 4 or 5 hours. Transported through congested traffic at 10 to 20 miles per hour. Built like a sky scraper. Heavy reinforced, riveted construction throughout. Heavy 8x8 in. steel angle legs. 4x4 in. steel angle bracing.

A giant of giants. 11 ft. 3 in. x 18 ft. 0 in. x 20 foot high in the 80 ton and 22 foot high in the 105 ton.

All parts reached by permanent steel ladders.

The most revolutionary Agrabatcher improvements of all time.

Operation by single hand wheel and by single operator.

Operator stationed on TRILOK steel grating platform where he can see that all conditions are right for dumping the batches.

New Automatic Weighing Agrabatchers standard modified beam type of scale with two point suspension of load and equalizer. Will fill and weigh even though bin is not level.

Measuring Agrabatchers. A minimum of six batches per minute.

Agrabatcher Adjusting Device supplied only on order. The turn of a single control wheel raises or lowers agrabatchers simultaneously on all four supporting bolts.

Shipped completely assembled in two halves. Only trailer wheels detached.

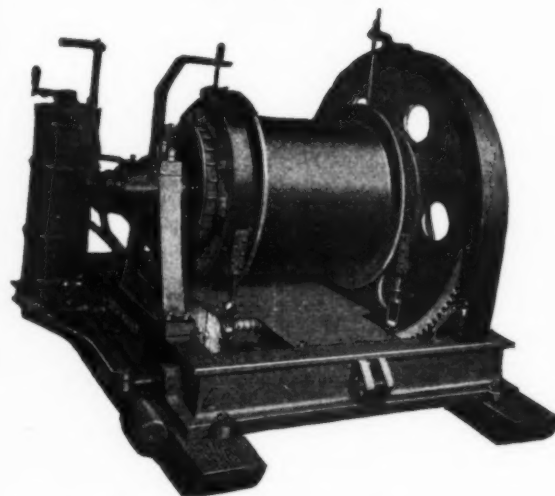
The material handling marvel of all time.

Write for prices and descriptive circular.

The Heltzel Steel Form & Iron Company
36 Thomas Road, Warren, Ohio

Manufacturers of Steel Road Forms, Steel Curb Forms, Steel Curb and Gutter Forms, Steel Sidewalk Forms, Mixing Boxes, Agrabatchers, Trailer Bins, Stationary Bins, Manhole Forms, Sewer Forms, Pipe Forms, Finishing Machines, Strikeoffs, Trail Graders, Subgrade Testers, Traveling Bridges, Car Unloaders, Steel Mortar Boxes, Steel Tool Boxes, Joint Machines.

HELTZEL



High Speed Electric Builders' Hoist

Operates building material elevator, carrying two loaded wheel barrows; an estimated rope pull at the drum of 1200 lbs.

This hoist has a rope pull of 1400 lbs., giving the quick, snappy operation required in this work.

It insures a constant supply of material to the men, cuts out their lost time waiting, and adds to your profits.

Fitted with either A.C. or D.C. motor, or gasoline motor driven.

*One operating concern has over
100 of these hoists in use.
Can anything more be said?*

Electric — Steam — Gasoline — Belt
HOISTS FOR ALL TYPES OF CONTRACTING WORK
CABLEWAYS DERRICKS

LIDGERWOOD MFG. CO.

96 Liberty Street, New York

Chicago Pittsburgh Philadelphia Columbus, O. Seattle
Portland, Ore. Tacoma Birmingham, Ala.

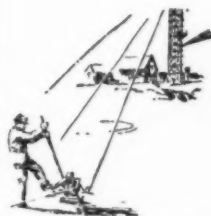
Sales Agents: Norman B. Livermore & Co., San Francisco; Woodward Wight & Co., New Orleans; John W. Westbrook, Inc., Norfolk, Va.; Cameron & Barkley Co., Jacksonville, Miami, Tampa, Fla.; Riechman Crosby Co., Memphis, Tenn. F. C. Richmond Mch. Co., Salt Lake City, Utah; H. H. Meyer Co., Baltimore, Md.; Garlinghouse Bros., Inc., Los Angeles, Cal.

Foreign Offices: London, England; Sao Paulo, Brazil, Rio de Janeiro, Brazil; Canadian Allis-Chalmers, Ltd., Toronto, Canada.

Learn More About This Time and Labor Saver

Send the coupon below for more information about this little device. Handy-Andy is the pulling jack of all trades. Contractors, street repair departments, water departments, mines, oil producers, refiners, gas companies, light and power companies, drainage boards, factories, dredgers, roadbuilders—all find him a time and labor saver on many jobs.

10 to 40 Tons Line Pull. Handy-Andy is Portable, compact, light. Works on ratchet principle. Handier than a lifting jack. Works in close quarters. Saves tying up big, expensive equipment. Simple to operate, little to get out of order. Soon pays for itself.



Tighten Guy Lines Easily

This powerful little tool insures rigidly tight guy lines and cables on aerial tramways with a few ratchet movements of the handle.

Pulling Pipe and Closing-up Pipe Sections

Handy-Andy is just the tool for pulling used pipe and closing up aqueduct and heavy pipe sections.



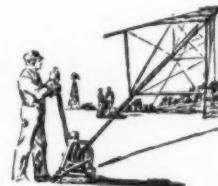
Pull Heavy Forms Quickly

Handy-Andy is a convenient, powerful, compact tool for form removal on all classes of work in crowded quarters.



Hoist Heavy Towers

Handy-Andy enables the operator to hoist heavy towers with perfect control over them at all times.



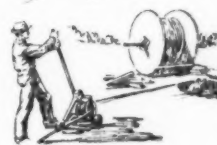
String Transmission Wires

An invaluable tool for tightening all kinds of lines on line construction and in overhead departments.



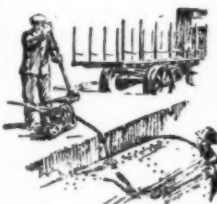
For Conduit Work

Because of its compact size and shape Handy-Andy can be used in inaccessible places. The tool for pulling out and replacing grounded cable.



Pull Trees and Small Stumps

Parks, development contractors, road builders—all find Handy-Andy a money saver on this kind of work.

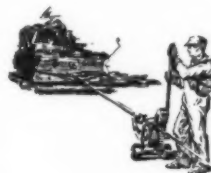


Move and Set Boilers

The automatic reverse on Handy-Andy makes it possible to have absolute control of heavy equipment when lowering.

Pull Sheet Piling

After the crane has gone use Handy-Andy to yank out the sheet piling. Pulls all kinds of piling.



Move Heavy Machinery

Factories, contractors and riggers find Handy-Andy an invaluable piece of equipment for this work because of its tremendous capacity.

Yank Out Stalled Trucks

Every Operator of motor fleets needs a Handy-Andy on his emergency car.



Use Handy-Andy for—

Pulling Bridge Floors
Setting Big Valves and Meters
Binding Pile Clusters
Installing Culverts
Demolition and Wrecking
Moving Tanks and Houses
Sinking and Pulling Well Casings
Loading and Unloading Heavy Machinery
Pulling old piling
Rerailing Rolling Stock
Dock and Bridge Construction
Moving Transfer Cars
Spotting Cars Short Distances



Shift Track with Handy-Andy

On refuse dumps in strip mines, on railroad maintenance—one man can do the work of two or three and faster.



Move Barges Easily

No need to tie up other expensive equipment moving heavy barges into slips or to unloading shovels.

Manufactured by

JOHN WALDRON CORPORATION

New Brunswick, N. J.

(Est. 1827)

Reg. U. S. Patent Office

HANDY-ANDY

THE BIG LITTLE **PULLER** FOR CONTRACTORS

John Waldron Corporation, New Brunswick, N. J.

Please send me prices of Handy-Andy Pulling Jack and bulletin showing rigging.

Could I use it for.....?

Name.....

Firm.....

Address.....

AUTO TRUCK DERRICK

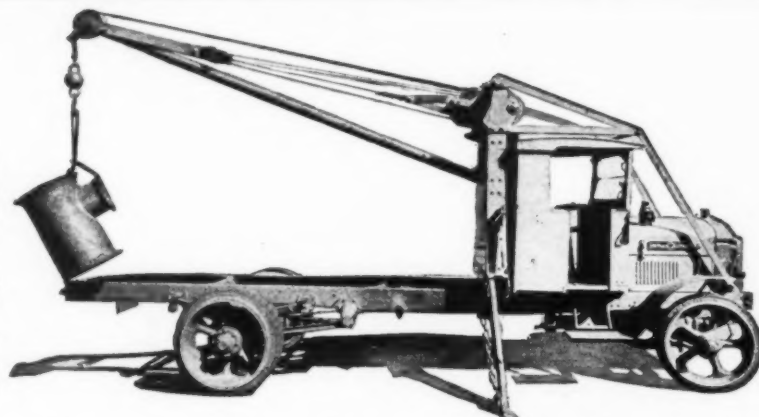
HOISTS...LOADS... DIGS

CONVERT your truck into a TIME and LABOR saver with this derrick. It will serve many purposes if mounted on a chassis of sufficient tonnage.

With HOOK or CHAINS, it lifts pipes, girders and other solid objects. With LAZY TONGS it handles barrels, bales, boxes, crates, etc. With CLAM SHELL or ORANGE PEEL bucket it loads stone, gravel, sand, coal and other soft or loose material.

ONE OPERATOR standing on truck has absolute control over the load and its placement.

The construction of this derrick is such that it can be knocked down, packed compactly and shipped anywhere. Derrick has large factor of safety over specified capacity. Protection from breakage due to overload is insured by



patented slipping clutch set to lift slightly in excess of rated capacity.

Operation of clam or orange peel bucket is simple, any unskilled workman can operate this machine and it will also do the work of vertical hoists on trucks for raising and lowering body.

Prices and fuller details will be sent on request. Certain territory still available for first class Distributors. Correspondence invited.

ATIA CORPORATION, 150 Broadway, New York, U.S.A.

Also ATIA Ash and Garbage Removal Bodies



**Clip This
"Ad"—
It May Show
You How
To Lower
Excavating
Costs**

This new booklet contains a wealth of ideas for the man who wishes to improve his methods of handling excavating work. It tells in detail how the Sauerman Slackline Cableway digs, conveys and elevates, and is operated by one man. It is full of diagrams and pictures showing how other users have lowered their excavating costs. All it will cost you is the 2c. stamp on your envelope. Just clip this "ad"—sign your name and address—and send it to us.

Name

Address

City and State

SAUERMAN BROS., INC.
480 So. Clinton St., Chicago

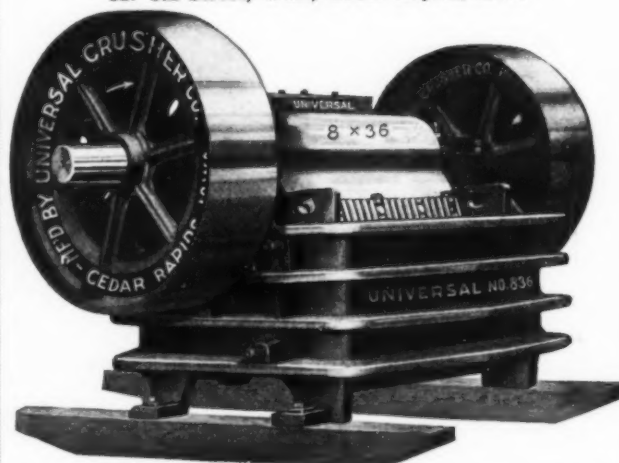
UNIVERSAL all-steel crushers

For crushing boulders, limestone, granite, gravel or any other form of rock no matter how hard or soft, UNIVERSAL ALL STEEL CRUSHERS will give you service that will satisfy. Universal Crushers include the most complete line—22 sizes—in the United States, and they embody over twenty years' experience in the design, building and use of crushers. Daily capacities to 450 tons.

For highway builders, quarries, construction jobs, Universal Crushers handle a great range of sizes with remarkably low upkeep and operating costs.

Stationary or Portable with or without elevators and screens.

UNIVERSAL CRUSHER COMPANY
327 8th Street, West, Cedar Rapids, Iowa



Choose/

*for the life of
your ~~paver~~
pocketbook*



Bearings—There
is the story of paver life
—and paver delays

TIMKENS in the MultiFoote, not only roll easily and deliver the full power of the engine but they maintain shaft alignment, eliminate the pounding out of gears, take successfully the strains of service and do away with turning up 25,000 grease cups each season.

Timkens in the MultiFoote, the only completely Timken equipped paver, have established greater paver life and abolished the major paver delays.

The Foote Company, Inc. of Nunda, N.Y.
The world's largest exclusive builders of road pavers

FRANK HALL
152 West 42nd Street
New York City

MULTIFOOTE
SALES CO.
2811 Fulton Street
Chicago, Ill.

WILCOX BROTHERS,
Inc.
588 Chenango Street
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BURTON FRANKLIN
Volunteer Bldg.
Chattanooga, Tenn.

E. J. McHARG &
COMPANY
31 Crestmont Road
Binghamton, N. Y.

EDWARD R. BACON
CO.
Folsom at 17th Street
San Francisco, Calif.

MULTIFOOTE
The Paver with Timken Bearings

SM 2-Gray



The arrow indicates the No. 23 Smith Mixer still in use by the John Hill Construction Co., of St. Louis, after 15 years of steady service.

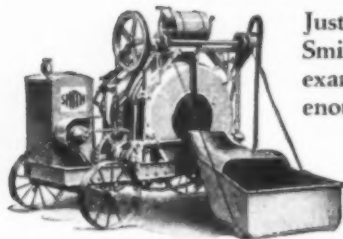
Another—
that won't lie down!



MIXERS have long been famous for their perfect mixing—their easy tilting drums, their fast discharge—and especially for a ruggedness which stands up dependably through years of steady service.

Every now and then one of the "old originals" turns up—still going. These are things you like to talk about.

Fifteen years ago the John Hill Construction Co. of St. Louis bought a No. 23 Smith Mixer. The same machine with which they completed one of their latest jobs—the Maternity Hospital of the Barnes Hospital group in St. Louis.



The new Smith 7-S Non-Tilting Mixer equipped with power loader

Just another example of Smith stamina — another example of a Smith, old enough to be on a pension, that won't lie down.

Today, of course, we're building them better!

ASK FOR 1927
CATALOG NO. 529

Smiths are made in all standard sizes from the 2½-S to the 112-S, the world's largest mixer. Made in both the tilting and non-tilting forms.



The T. L. SMITH COMPANY
1084 32nd Street, Milwaukee, Wis.
Sales Offices and Service Stations in
All Principal Cities

SMITH MIXERS

To Fill Any Form



The Stuebner Controllable Concrete Bucket with its patented device for regulating the width of discharge opening is extremely useful when you are filling narrow or inconveniently located forms.

It is a genuine time saving piece of equipment which pays for itself by stopping the waste of material. Write for information.

Turn-over and Bottom Dumping Buckets,
Flat Cars, Push Carts, Steel Skips,
End and Bottom Discharge Cars.

G. L. Stuebner Iron Works

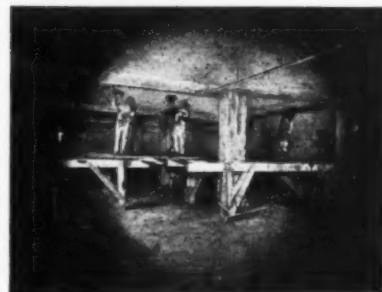
Incorporated
Vernon Blvd., Long Island City, New York

What a Difference Carbic Lights Make!



Interior construction scene without the use of Carbic Lights. Men cannot work efficiently in darkness.

Same as above, but now this wise contractor has placed Carbic Portable Acetylene Lights on the job. Men work best with good light.

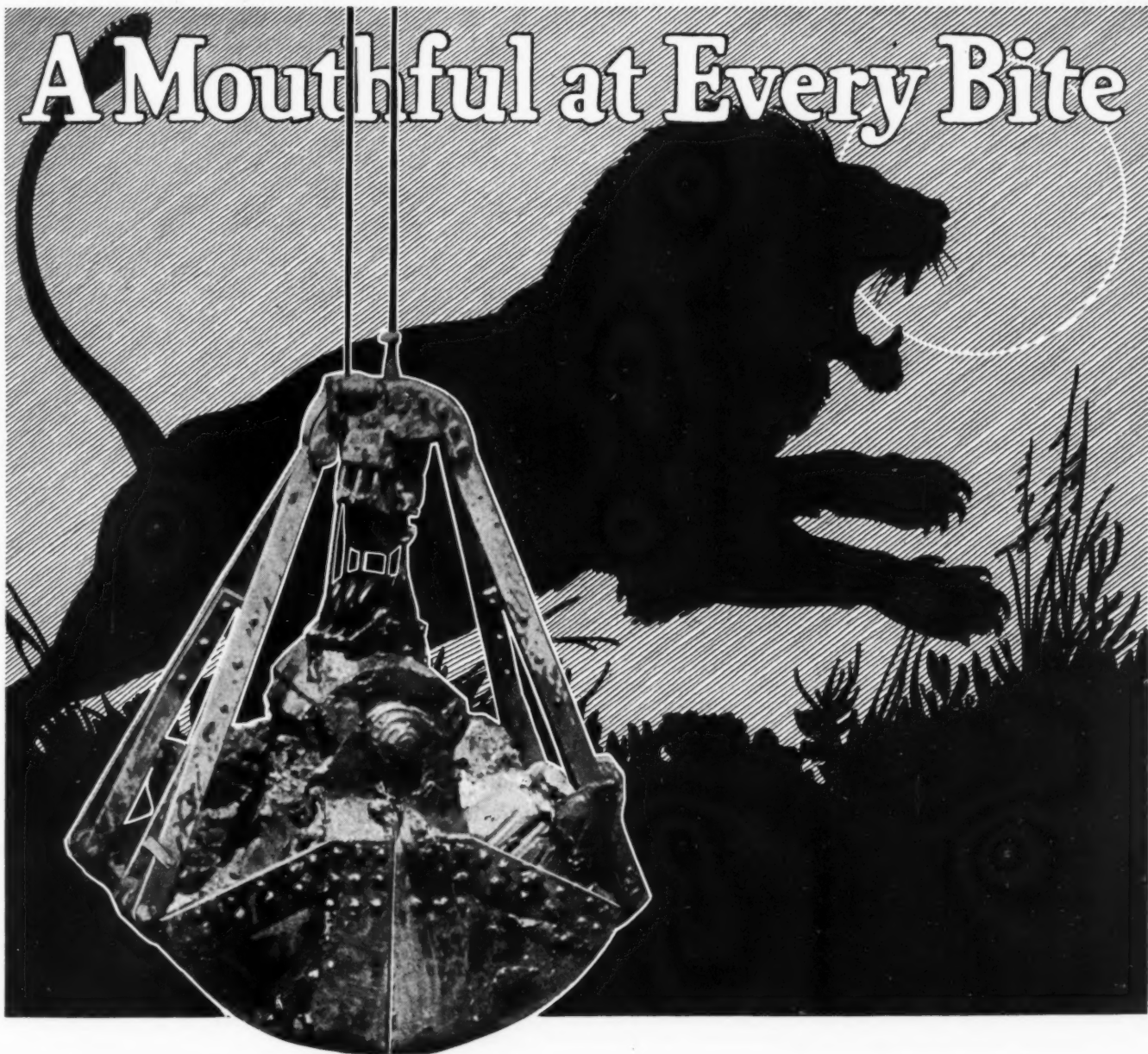


THERE IS A CARBIC LIGHT FOR EVERY NEED.

Write for catalog.

CARBIC MANUFACTURING CO.
NEW YORK — DULUTH, MINN. — CHICAGO
GENERAL OFFICE
CARBIC PRODUCTS STOCKED IN OVER 75 CITIES

A Mouthful at Every Bite



HERE'S the type "D" Owen Bucket . . . a digging machine of tremendous power that puts the strength of a lion into its savage "bite".

It simply "eats up" work in stiff clay, broken slag, ore, and shale or indeed any kind of heavy duty excavation. This rugged bucket will save you money and time, for like the powerful "King of Beasts" it gets "A Mouthful at Every Bite".

No matter what type of work you do there's an Owen Bucket specially adapted to it. Write for details.

THE OWEN BUCKET CO.

6023 BREAKWATER AVENUE

CLEVELAND, OHIO

Note the breadth of this guarantee—an indication of our confidence in the Owen Bucket.



Owen Buckets

PULLMCO

THE ONLY PULLER

Having all features a puller should have

2 levers
low fulcrums
brake



All steel
wide wheels
smooth drum

A PORTABLE POWER PLANT

For Road, Sewer, Dock, Bridge and other construction, Car Spotting, Wrecking, House Moving, Land Clearing and Material Handling.

Anchors by hook or cable. Works in any position.

Simple as a Lifting Jack

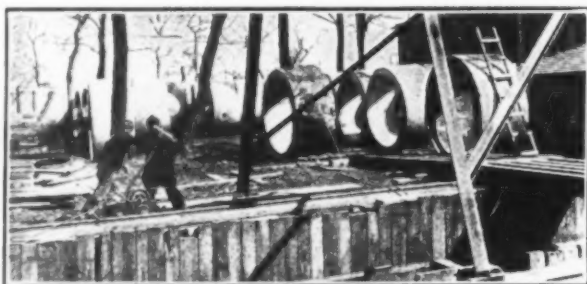
SPEED	PER MIN.	DRAW BAR PULL	
1st	3 1/2	Ft. 9 to 12 Tons	WITH LEVERS
2nd	6 1/2	Ft. 2 to 9 Tons	
3rd	11	Ft. 1 to 2 Tons	
4th	33	Ft. 0 to 1 Ton	WITH CRANKS
5th	65	Ft. Ratio 6 1/2 to 1	
6th	85	Ft. Ratio 3 1/2 to 1	

Pull Can Be Increased to 100 Tons With 4 Tackle Blocks

The Puller that will do the job in the shortest time.

WHY? It can be pulled from place to place like a cart.
Speed can be changed instantly to suit load.
Brake (capacity 1,000 lbs.) can be used to slacken cable.

SPEED COUNTS



Sewer Construction



Pulling Mixer Over Soft Ground



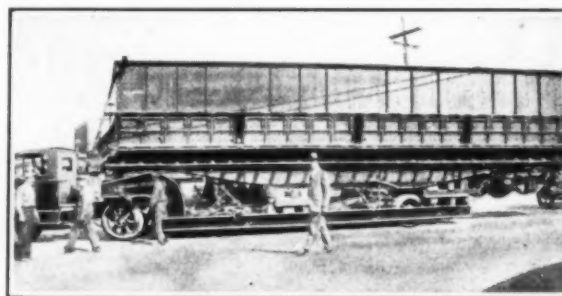
Car Spotting

WRITE FOR "POINTS ABOUT PULLERS."

Describe Your Problem. It Will Help Us to Help You.

PULLER MANUFACTURING CO.

600 West 57th St., New York, N. Y.

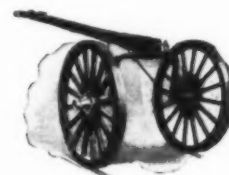


Moving 52 Ton Railroad Cars

Four miles on a ROGERS GOOSE-NECK 6-wheel trailer. The high qualities of ROGERS TRAILERS demonstrate daily its worth in moving big loads.

Let us figure on YOUR hauling problems.

ROGERS BROTHERS CORPORATION
Albion, Pa.



for quick manipulation of
sewer and waterworks castings,
pipe, timber, etc.

You'll find Dobbie Sulky Derrick and Pick-Up Carts being used all through the engineering and contracting field. Your work of handling bulky pipe, timbers, etc.—is quickly done when you use Dobbie Equipment, and speed in operation means higher per cent profit.

Our illustrated booklet shows further details on this equipment—Send for your copy.

Dobbie Foundry and Machine Co.
Niagara Falls, N. Y.

DOBBIE EQUIPMENT

PICK-UP CARTS—HOISTS, ALL TYPES
SULKY DERRICKS—DERRICK FITTINGS

6 Advantages You Obtain in Buying a **WONDER**

The Original Single Opening Tilting Mixer

**A
Non-Tilter
Can't Give You
These Advantages
at
Any
Price**

THESE Wonder Tilter advantages have revolutionized the mixer industry. They have given the contractor a lower mixing cost. In our 1927 catalog you will find proven reasons why thousands of contractors are turning to the Wonder Tilter in all sizes from 3½ cubic feet to 14 cubic feet capacity.

- 1 SIMPLICITY**—A single mixing drum bearing instead of four. The mixing and discharging operations are accomplished with one-third of the moving-wearing parts used in the non-tilter design.
- 2 MORE RAPID DISCHARGE**—The mixed batch pours out in a rushing stream. It is not mechanically persuaded out with complicated bucket and chute arrangement.
- 3 PERFECT BEARING PROTECTION**—So perfect, that combined with its minimum of friction, we are able to guarantee the **WONDER** mixing drum bearing for the life of the mixer.
- 4 A MIXING DRUM**—that always cleans and is always clean.
- 5 LESS BEARING FRICTION**—Resulting in less wear and upkeep expense throughout—requiring less horse power.
- 6 ADJUSTABLE MIXING POSITION**—Making possible 100% mixing efficiency of any proportion and of any consistency.

Construction Machinery Co.

Nationally Distributed from Convenient Points

403 Vinton Ave.

Waterloo, Iowa



**Just off the Press
Completely Illustrated**

**Write for Your
Free Copy Today**



Laying an 84-in. INDEPENDENT Concrete Sewer at Royal Oak, Mich.
S. A. Healy, Contractor, Detroit.

Speed in Laying an 84 in. Concrete Sewer

YOU can lay an INDEPENDENT Concrete Sewer with greater speed and economy because—

The pipe is built locally; always ready to lay when the contractor wants to start work.

Pipe units are made accurately and fit perfectly—easier to handle and align.

The "Recessed Joints" are sealed quicker and better. The LOWER half is filled INSIDE the pipe, the UPPER half of the joint recess is sealed OUTSIDE the pipe.

This makes a strong, smooth, tight joint, with less labor and material.

Backfilling can follow as fast as each joint is sealed.

The quality of INDEPENDENT Concrete Pipe, plus the efficiency of the "Recessed Joint", assure the community a more permanent sewer, and the contractor a more profitable job.

Before you bid on any concrete sewer work, let us give you estimates on the use of INDEPENDENT Pipe. Write, wire or phone us—Main 2131.

INDEPENDENT CONCRETE PIPE CO.
209 N. West St., Indianapolis, Ind.

INDEPENDENT

Reinforced Concrete Pipe

The most **ECONOMICAL** material
for building **PERMANENT** sewers

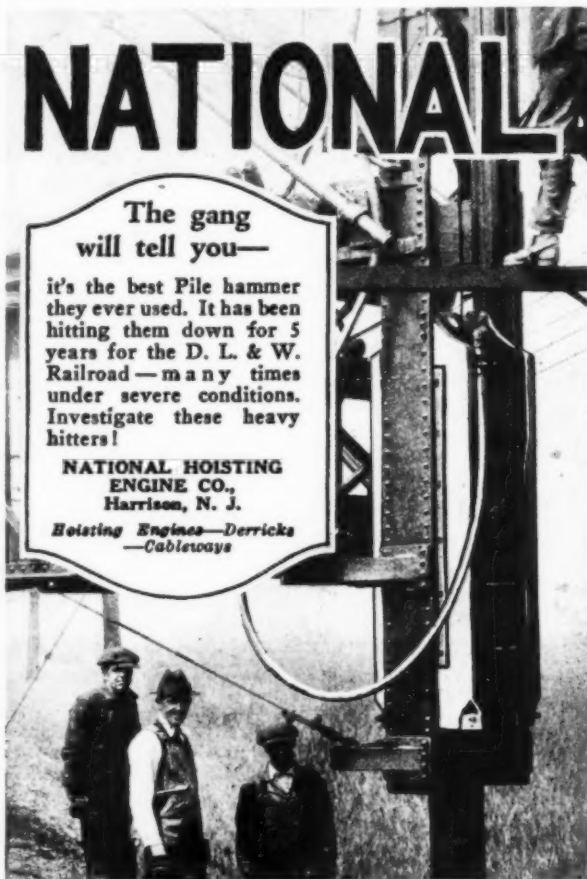
NATIONAL

The gang
will tell you—

it's the best Pile hammer they ever used. It has been hitting them down for 5 years for the D. L. & W. Railroad—many times under severe conditions. Investigate these heavy hitters!

NATIONAL HOISTING
ENGINE CO.,
Harrison, N. J.

Hoisting Engines—Derricks
—Cableways



Three No. 3 UNION Hammers On This Job

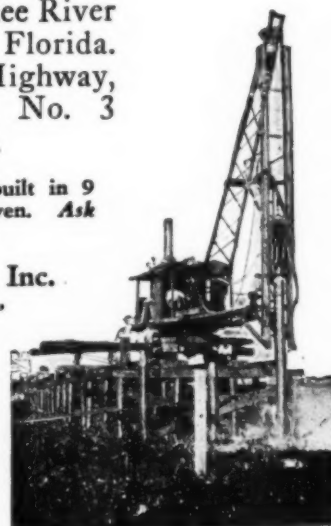
Illustration shows the Union driving creosoted pile on Harding Memorial Bridge (east approach) across the Kissimmee River and marsh in Florida. Connors Florida Highway, Inc., used three No. 3 Unions on this job.

Union Hammers are built in 9 sizes—steam or air driven. Ask about them.

Union Iron Works, Inc.
Monroe and Grove Sts.,
Hoboken, N. J.

Builders of Double Acting
Pile Hammers Since 1906

UNION PILE HAMMERS
DRIVE
AND
PULL



The new **Bear Cat** **SHOVEL**



Real Shovel Work with Bear Cat Economy

THE new Byers Bear Cat Shovel has been designed to meet the demand for a real shovel of half-yard capacity, capable of doing hard work, and economical to buy and to operate.

The rope crowd is easily operated and very fast, faster than the crowd on any shovel that we know of at the present time. It is positive in action, and does not depend upon any other factor in the operation of the machine.

The power and ruggedness of the Bear Cat are so well known as not to need emphasis here. The machine is noted everywhere for its endurance, dependability, and freedom from repairs.

The standard Bear Cat attachments consisting of clamshell, skimmer, etc., all fit the new shovel without change and without removal of any part of the mechanism except the boom.

Send for the new Bear Cat Shovel Bulletin.

THE BYERS MACHINE CO., Ravenna, Ohio
Builders also of Byers Truckcrane

Sales and Service Throughout
the Country

The Byers Machine Co., Ravenna, O.
Gentlemen:—

Please send a copy of the new Bear Cat Shovel Bulletin. The kind of work we are particularly interested in is.....

Name
Address
City
State.....
SM 2-27

BYERS BEAR CAT

THE ALL-PURPOSE ONE MAN CRANE SHOVEL



When the
Budget
Compels
\$1 to do
the Work
of \$2

The increased cost of production, caused by trucking over rough floors, is a matter of grave concern to those charged with plant maintenance. The maintenance budget does not always permit the laying of new floors.

When our 1.2.3. Hydro-Proof Floor Resurfacer was presented to the industrial world, the problem of floor resurfacing was solved. Hundreds of America's leading industries have already saved tens of thousands of dollars by the Hydro-Proof process. They have found in Hydro-Proof a method for resurfacing floors that is permanent, economical and convenient.

Whether your present floors are concrete, brick, asphalt or wood, the Hydro-Proof method will permanently resurface them, at less than one-half the cost of other methods. Hydro-Proofed floors give a longer wearing surface than new floors, and are dustless, water, acid, alkali and spark proof. They reduce trucking expenses to the minimum. Their resiliency greatly lessens industrial fatigue, and increases to the maximum, your employees' efficiency.

Let us show you how we can materially reduce your production expense, by sending you working samples of our 1.2.3. Hydro-Proof Floor Resurfacer, without expense or obligation to you.

THE ASPHALT PRODUCTS CO.
704 Free Street, Syracuse, N. Y.

MAIL THIS COUPON

THE ASPHALT PRODUCTS CO.,
704 Free St., Syracuse, N. Y.

You may send me working samples of HYDRO-PROOF. I understand this is to be sent me free of charge and without placing me under any obligations.

Company

Individual

Address

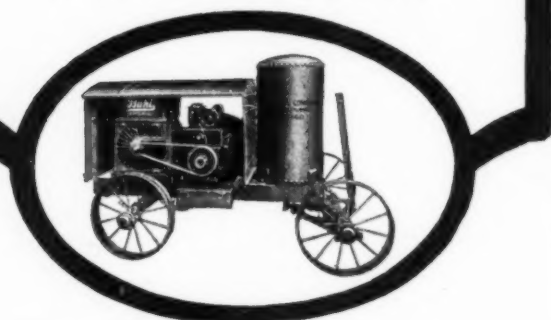
Buhl

AIR COMPRESSORS

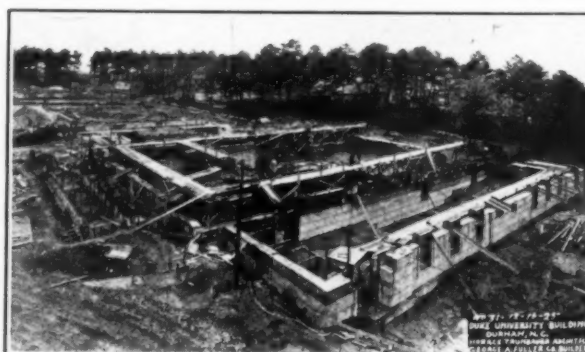
Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

This is a sturdy, compact, portable compressor. It is a single cylinder outfit with gasoline engine and compressor cylinders cast en bloc. Made in 55, 90 and 180 cu. ft. capacities. Any mounting desired. Also other models. Send for Bulletins.

THE BUHL COMPANY
Manufacturers
37 W. Van Buren St., CHICAGO



METAFORMS



Save on forms!

Use Metaform Interlocking Steel Units on every concreting job, saving time, labor, and producing a better job. Metaforms can be put up or taken down by unskilled labor in a jiffy. They save waste of lumber in building forms.

Metaforms can be used again and again on job after job. They are permanent equipment. Each unit is fitted with sturdy clamps for quick interlocking.

Write for details and prices.

Metal Forms Corporation
Milwaukee, Wis.



Standard Hoists and Derricks

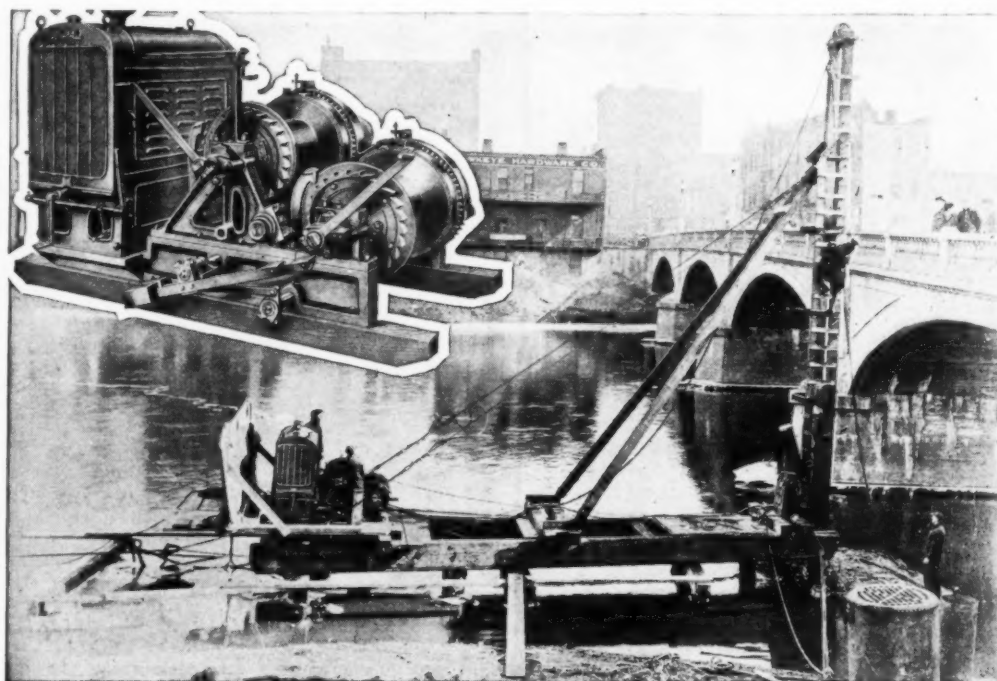
For the General Contractor

STEAM · ELECTRIC · GASOLINE · BELT

The City of Cedar Rapids, Ia., has utilized an island in the river for community buildings. In this construction it was necessary to build a retaining wall around the island, and do considerable filling to bring the main floor of the building to the bridge level.

A sixty horsepower double drum Clyde Gasoline Hoist was used for driving piles by the Allied Contractors, Inc. of Omaha, who handled the job. Although the hoist handles a 3,500-lb. hammer, it was found that one of 2,500 lbs. was quite sufficient to handle the work satisfactorily. The operators are entirely satisfied with the performance of their hoist.

You'll Take Pride In Your Clyde!



CLYDE IRON WORKS SALES CO.

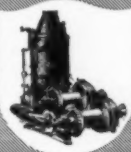
DISTRIBUTORS FOR CLYDE IRON WORKS
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SEATTLE: 3410 FIRST AVENUE SOUTH

CHICAGO: 11 SOUTH LASALLE STREET
CINCINNATI: 1913 UNION CENT. BUILDING
MEMPHIS: 69 UNION AVENUE
JACKSONVILLE FLA.: 43-45 W. FORSYTH ST.
SAN FRANCISCO: 739 MONADNOCK BLDG.



TWO MARKS OF



GUARANTEED QUALITY



INTRODUCING THE
LOWELL
REVERSIBLE RATCHET WRENCH

A WRENCH FOR EVERY PURPOSE
A SIZE FOR EVERY NEED



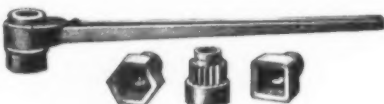
1916 Pattern

Finished all over. Gear openings both hexagon and square from $\frac{1}{4}$ -in. to $1\frac{1}{2}$ -in. across the flats.



Lag Screw Pattern

Finished in black enamel with socket openings both hexagon and square from $\frac{1}{2}$ -in. to $1\frac{1}{2}$ -in. across the flats.



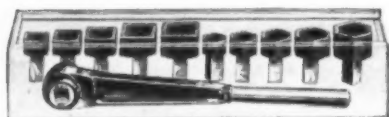
Steel Socket Bridge Pattern

Finished in black enamel with socket openings both hexagon and square from 1-in. to 6-in. across the flats.



Bridge Builders' Pattern

Finished in black enamel with gear openings both hexagon and square from 1-in. to $4\frac{1}{2}$ -in. across the flats.



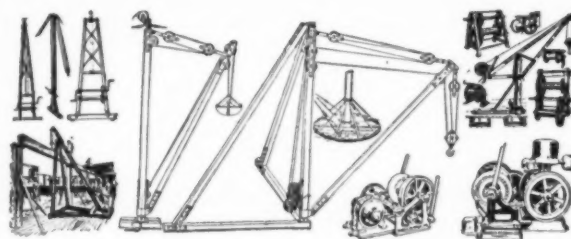
Multiplex Set

No. 1—Capacity $\frac{1}{4}$ -in. to $\frac{3}{4}$ -in. inclusive.
No. 2—Capacity $\frac{3}{4}$ -in. to $1\frac{1}{4}$ -in. inclusive.
Expressed in bolt diameters.

LOWELL
WRENCH CO.

WORCESTER, MASS., U. S. A.

ASK FOR CATALOG M



Derricks—
Hoists—
Winches—

The name Sasgen has been identified for many years with large and small building construction.

All sizes up to 10 Ton

Send for Circular S

Sasgen Derrick Co.

3101 W. Grand Ave.

New York:
130 W. 42nd St.

Chicago

KONY TARPS

Tarpaulins

All Sizes

Large Stock Always on Hand

IF it's of CANVAS
"We make it!"

Truck Covers

and Rope Slings

Tents

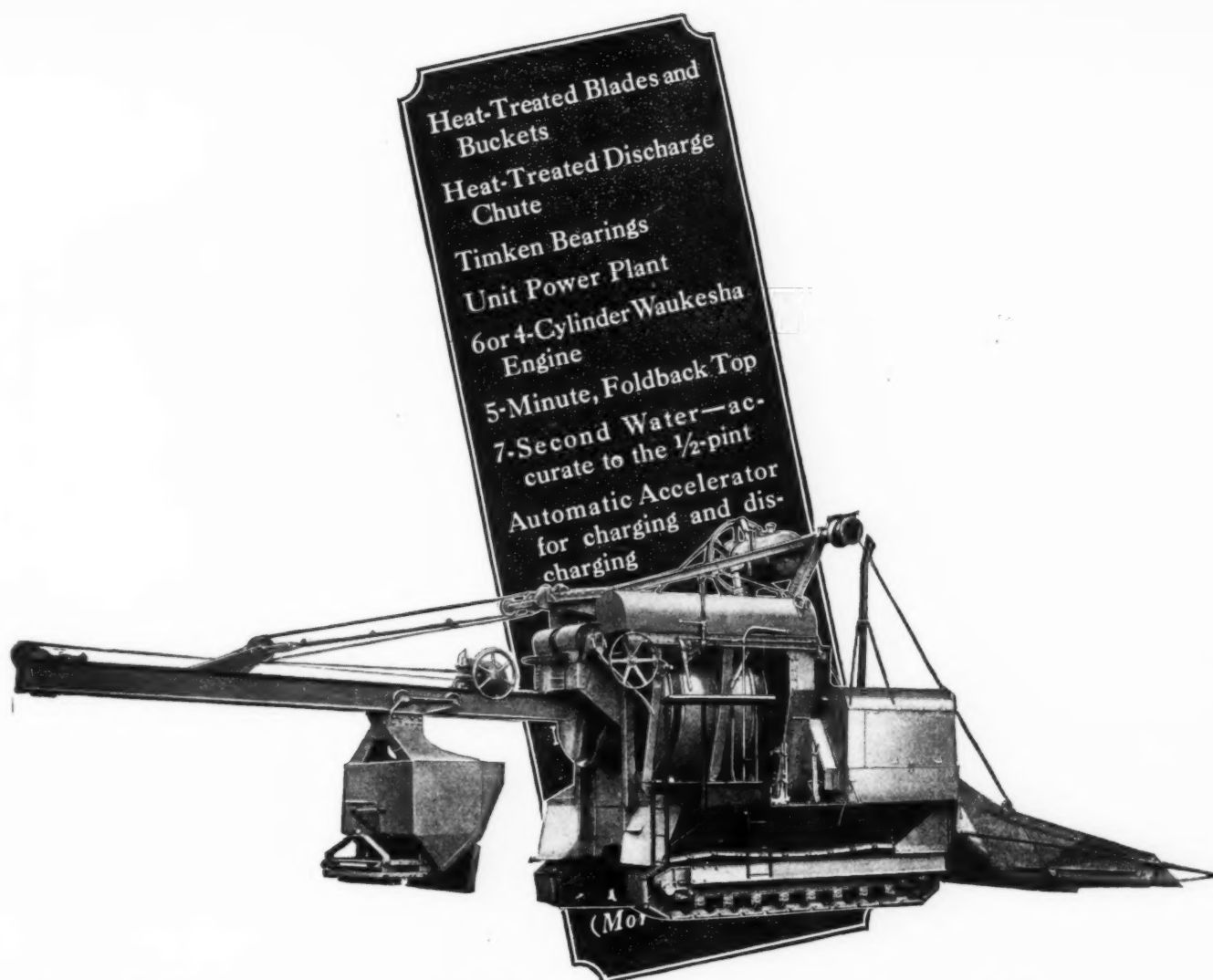
and all kinds of Canvas Products

Sand Blast Equipment, Etc.

Get our prices before buying elsewhere.

KUNKELY OF NEW YORK

155 Chambers St., New York



A New and Even Greater Rex— Just Check Other Pavers With It

If we were contractors we'd find out about a paver like this.

For this *New and Even Greater Rex 27-E* stands out as the most complete paver on the market today—as well as the fastest.

For instance, the mixing blades and buckets, and the discharge chute—upon the size of which Rex speed depends—are heat-treated. They defeat the abrasive wear occasioned by mixing—and assure the same high-

speed charge and discharge at the end of the season as at the beginning.

You'll find that the engine and speed reducer are combined into one single power unit.

You'll find that Timken Bearings and Dot High-pressure lubrication simplify maintenance and insure long life.

And you'll find a host of other new things which combine to make the Rex 27-E a New and Even Greater Paver.

And, in addition, you will find the time-tried features that have ever made Rex Pavers fast and famous—the 7-second water accurate to the half-pint, the 8-second discharge and Rex *Unified Action*.

If we were contractors we'd find out about a paver like that—sending for the 27-E catalog will show you why, in detail.

CHAIN BELT COMPANY, 764 Park Street, Milwaukee, Wisconsin

REX PAVERS

With Rex UNIFIED ACTION, the dollars you put into mixing concrete can buy as high as 40 minutes more work per nine-hour day.



- When in New York -

Do Not Fail To Visit The FORD POWER EQUIPMENT EXPOSITION

Here under one roof is an interesting display of over 200 exhibits of industrial, agricultural and commercial units, built to operate with the Fordson tractor and Ford chassis.

This exhibit occupies two entire floors of the Ford Building at 1710 Broadway. Nowhere else is it possible to quickly and conveniently see all the equipment for use with Ford units.

If you use power in your business you will see much to interest you. Ford equipment means economy. Come today—and see this exhibit.

Descriptive Circular Furnished Gratis On Any of the Above Equipment.

Ford

POWER EQUIPMENT EXPOSITION

Ford Motor Building

54th Street and Broadway, New York

The following are a few of the groups of equipment that can be seen on display:

GRADERS
SNOW PLOWS
LOCOMOTIVES
LAWN MOWERS
DUMP TRAILERS
TANK BODIES
DUMP BODIES
ROAD ROLLERS
STREET SWEEPERS
BACKFILLERS
CONCRETE MIXERS
CATERPILLARS
STUMP PULLERS
LOG SKIDDERS
SCOOPS AND SCRAPERS
TRACTOR TRAILERS
INDUSTRIAL SHOP
TRAILERS
AGRICULTURAL
IMPLEMENTS
MARINE ATTACHMENTS
AIR COMPRESSORS
COMMERCIAL BODIES
CRANES
HOISTS
PUMPS
LOADERS
SHOVELS
WOOD SAWS
SAW MILLS

Swinging more dirt per hour



Lower per yard cost—bigger marginal profit

This new 31-B moves more dirt per hour than other 1-yard shovels. The Bucyrus box girder boom is the lightest, strongest boom construction used on revolving shovels today. Less counterweight is needed—the result is less flywheel effect and a faster swing. Write for Bulletin C-311.

Bucyrus Company, South Milwaukee, Wisconsin
50 Church St., New York
134 South LaSalle Street, Chicago

BUCYRUS

Specify— Fuller & Johnson ENGINES

It is not only your privilege but it's good business to specify Fuller & Johnson Engines. It means money saved and contracts filled on time to have an engine that will always give you faithful service.

Realizing the importance of reliable and economical power, many of the leading manufacturers of construction equipment have standardized on Fuller & Johnson engines. You can benefit from their experience—in all cases specify Fuller & Johnson engines.

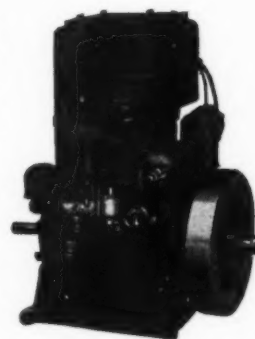
Every contractor should know about Fuller & Johnson engines. Horizontal, single cylinder types, 1 to 25 HP., see bulletin 430. Two cylinder vertical types, 6 to 8 HP., see bulletin AB500.

Let us send them both to you.

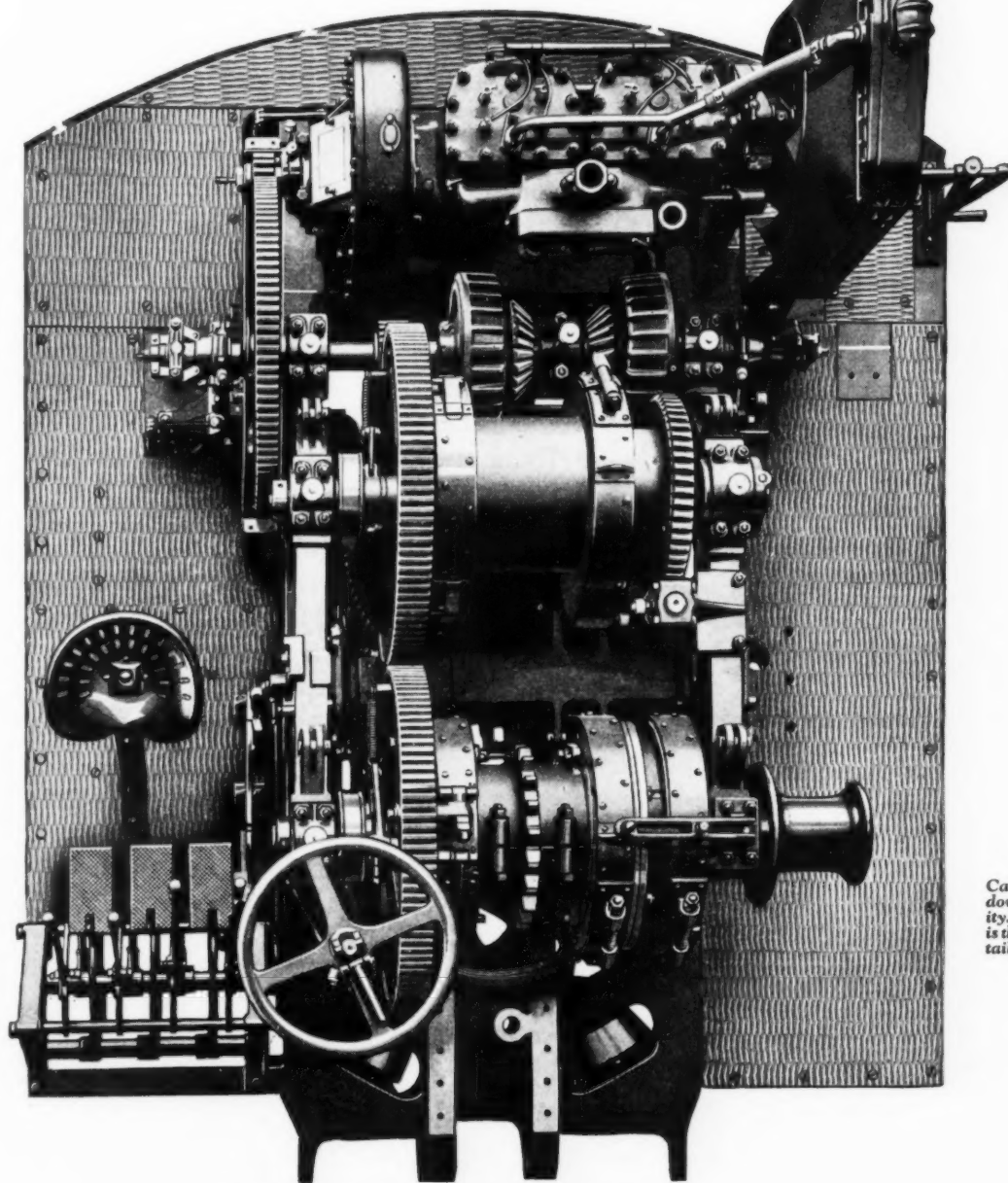
FULLER & JOHNSON MFG. CO.
Engine Specialists—Established 1840

107 SAWYER STREET MADISON, WIS.

FULLER & JOHNSON



SIMPLICITY



Proved
Machines
Again
Improved

Cab removed—looking down. Note accessibility. The compact layout is the reason for the short tail swing. Gear covers removed.

OPERATORS say that P&H Excavators are the simplest, most accessible and easiest machines to keep clean and in perfect operating condition of any machines built.

The illustration above shows the truth of this statement.

New Bulletin 61-X, the most complete book on gasoline excavators, mailed on request.

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Successor to
PAWLING & HARNISCHFEGER CO.

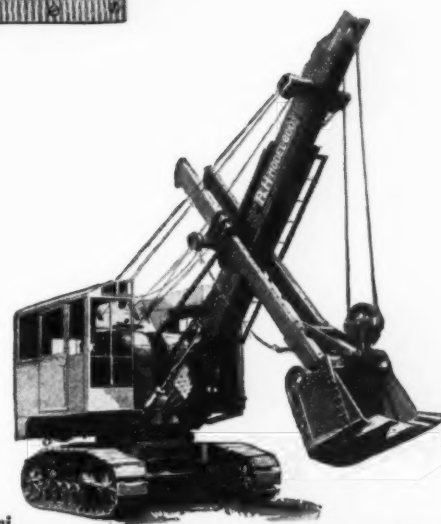
Established in 1884

3894 National Ave., Milwaukee, Wis.

Offices in all principal cities

WAREHOUSES AND SERVICE STATIONS

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EXCAVATORS

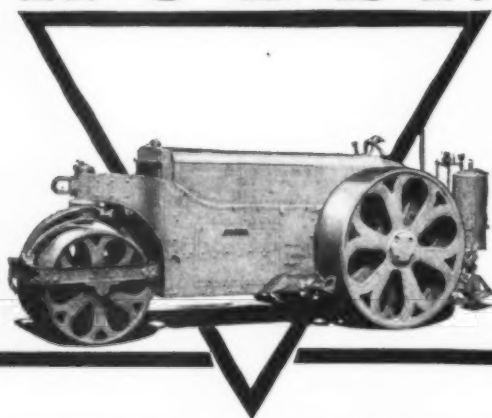
UNIT CAST STEEL CONSTRUCTION

GREAT for ROAD WORK

No matter what road or street work you have to do, the Huber never fails to effect remarkable savings and deliver unfaltering service to contractors who want the greatest four cylinder road roller they can buy. Send for complete catalog illustrating the Huber 4-Cylinder Roller in 5, 7, 10, or 12 Ton Sizes, with or without scarifier.

THE HUBER MANUFACTURING CO.
355 E. CENTER ST., MARION, OHIO

HUBER



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The most popular Transit made for Construction Engineers. Quality and Service standard for 23 years. 8½-in. Telescope, 5-in. Horizontal Plate graduated to read by Vernier to 60 sec.

Write for Illustrated Catalog.

KOLESCH & CO.
138 Fulton Street, New York



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387 Washington Street
BOSTON, MASSACHUSETTS

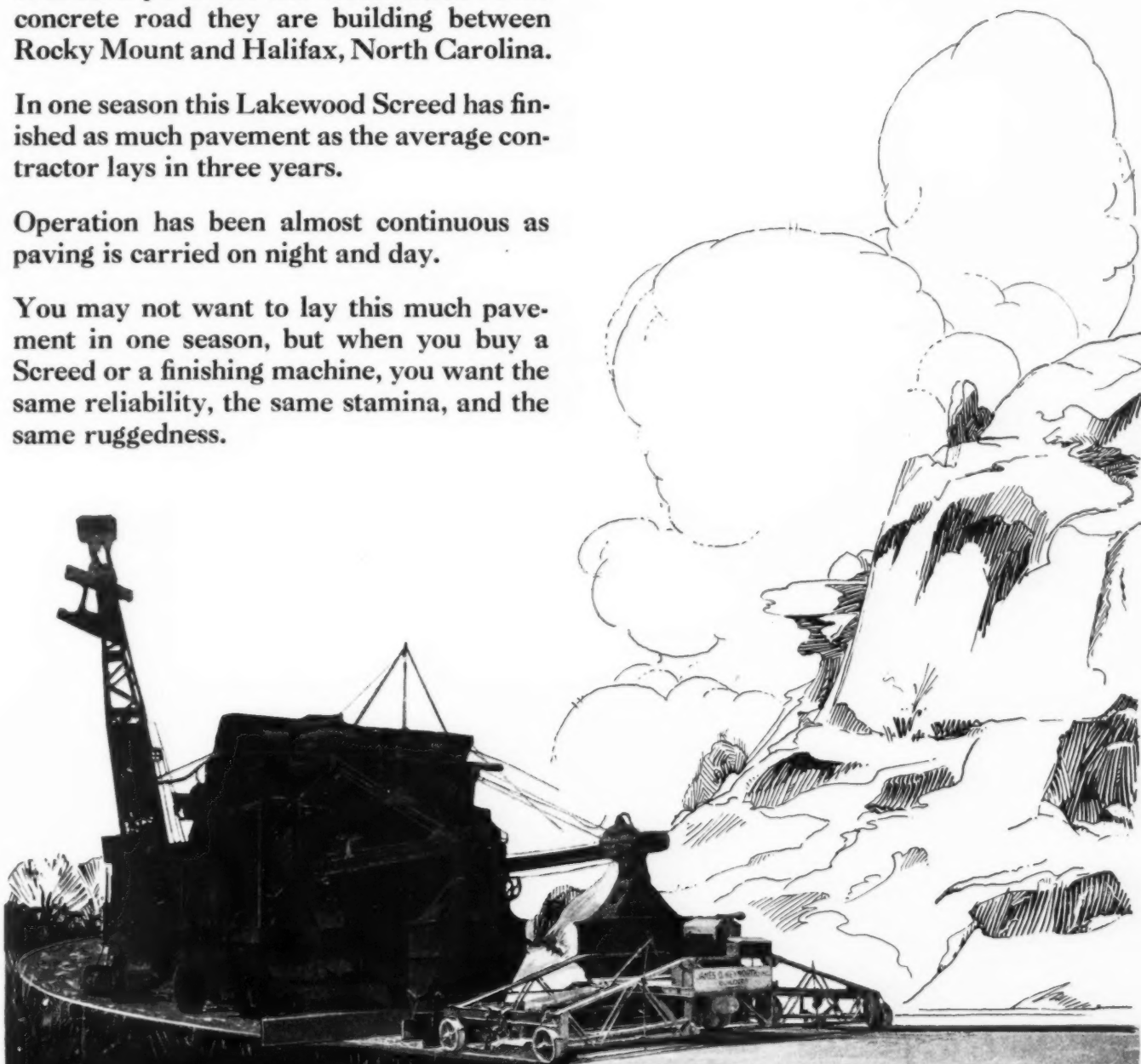
3 Year's Work in One Season -

James O. Heyworth, Inc., of Chicago, use a Lakewood Type "C" Screed behind their twin 32-E paver for the construction of the concrete road they are building between Rocky Mount and Halifax, North Carolina.

In one season this Lakewood Screed has finished as much pavement as the average contractor lays in three years.

Operation has been almost continuous as paving is carried on night and day.

You may not want to lay this much pavement in one season, but when you buy a Screed or a finishing machine, you want the same reliability, the same stamina, and the same ruggedness.



The

EXPORT OFFICE: 30 CHURCH ST., NEW YORK CITY

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LAKWOOD ENGINEERING CO.

CLEVELAND, OHIO

Why the Carter

HUMDINGER



4-in. pump with Le Roi Engine, 6,500 to 10,000 G.P.M.

Because—Rubber ball valves that eliminate clogging, seat tighter allow maximum capacity and greater suction lifts.

Because—Closed, threaded outlets allow pumps to discharge thru hose under pressure. No more troughs to build.

Because—Driving jack totally enclosed and running in a bath of oil, means longer wear, less attention.

Because—All steel trucks with wrought steel wheels eliminate breakage.

We'll be glad to send Humdinger Bulletins on request.



RALPH B. CARTER CO.
NEW YORK, N. Y.
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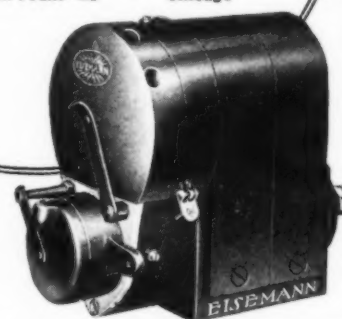


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PAVERS
CONCRETE MIXERS
AIR COMPRESSORS
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And all types of light and heavy road building machinery.

EISEMANN MAGNETO CORP'N
165 Broadway, N. Y.
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EISEMANN
ELECTRICAL EQUIPMENT



THE GREATEST DRAINAGE PUMP EVER BUILT

This was the opinion of contractors who saw Humphryes Double Four Lift and Force Trench Pump at the Road Show.

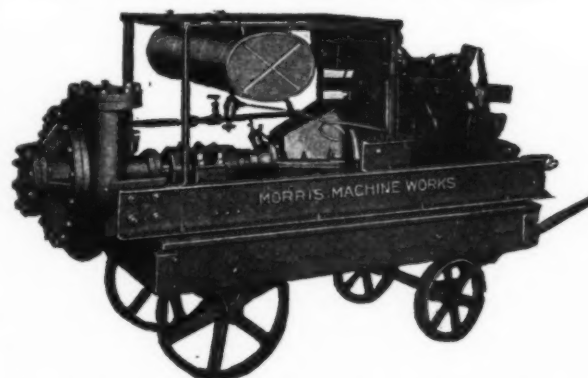
Compact and sturdily built with non-clogging features, combined with the high capacity of this pump, are features which enable the unit to solve practically every drainage problem.

Easily accessible and with no diaphragm worries this outside packed plunger pump is the most trouble-free pump on the market.

Write for Bulletin 290

The Humphryes Mfg. Co., Mansfield, Ohio
Distributors in Principal Cities

To make your unwatering and water supply problems easier!

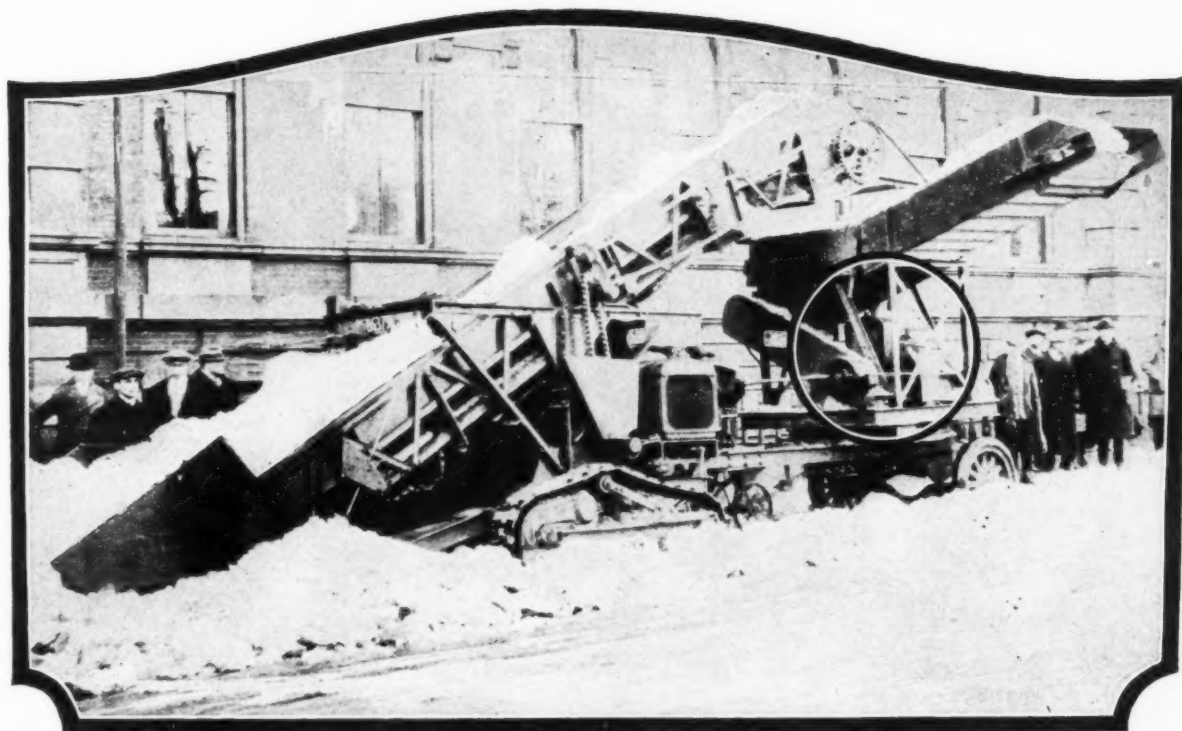


THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

Write for literature about this and other sizes of Morris Pumps

MORRIS MACHINE WORKS, Baldwinsville, N. Y.

MORRIS
CENTRIFUGAL PUMPS



"Hustling-Away" Snow!

CROWDED streets — busy thoroughfares — they *must be kept open*. Even when bristling blizzards and unruly snow flurries are at their worst. It's too costly to stand by.

And no "modernized" city does. Starting with the storm, they rush fleets of snow-loaders into service and clear the way. Whether it be a 2 inch or 2 foot fall, these snow-removers rapidly break the storm-grip and open wide the roads to travel.

Such equipment must be dependably powered. And most often the Le Roi gets the assignment. Le Roi's smooth, responsive power is the natural result of its precise and durable construction. No gas engine ranging from 3 to 15 H. P. boasts of a lower operating and maintenance cost.

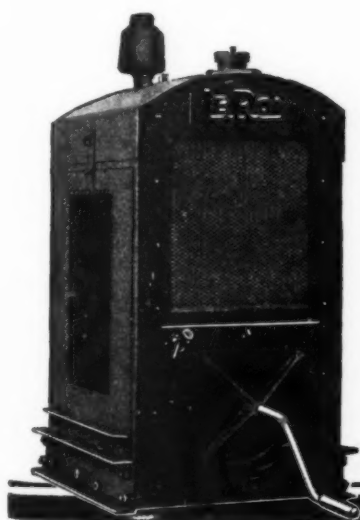
Look to the Le Roi for dependable power and know it by what it does.

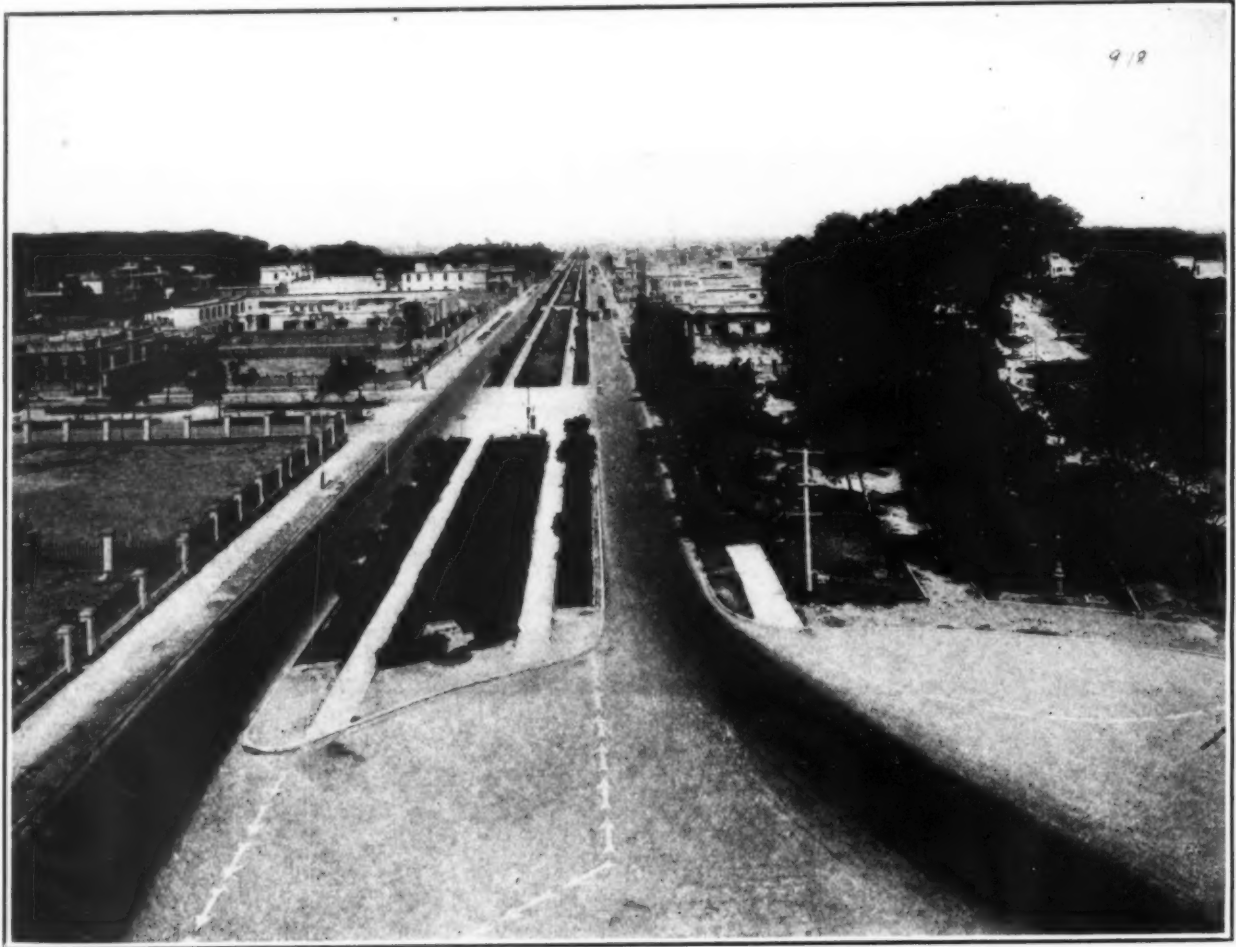
Le Roi Company, Milwaukee

LEROI ENGINES

for dependable power!

*Engine Builders
only!*





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Numerous Public Works are included in the program of construction undertaken by The Foundation Company for the Government of Peru. Among them are Water Works, Sanitation, Paving, Schools, Post Offices and other Public Buildings.

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BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

Mack

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handles heavy jobs with Speed and Profit

ALTHOUGH extreme portability is a prime essential in portable crane service, it might well be placed second to chassis ruggedness and dependability, for it is the chassis that is directly or indirectly subjected to all the

abusive stresses and strain.

The fact that a big percentage of portable crane jobs mounted upon Mack chassis are Macks that have previously seen years of regular transport service, is very definite evidence of Mack quality.

Always note the predominance of Macks where the going is hard.

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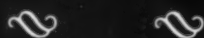
One hundred and four direct MACK factory branches operate under the titles of: "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION", "MACK MOTOR TRUCK COMPANY", or "MACK TRUCKS OF CANADA, LTD."

O-OX-K-L-G-TX-TXA-TXO

Here is, indeed, the code to better power.

The letters above designate the eight Hercules models, each of them embracing the [1] simplicity [2] compactness [3] ruggedness [4] agility [5] uniformity [6] ease of operation [7] constancy of power and [8] minimum of attention that

proper design, and
precise manufacture, from
best available materials assure.



And here follows the code to the sizes of these superior engines:

O-OX-K-L-G-TX-TXA-TXO

4"X5" 4"X5" 4 1/4"X5 3/4" 4 1/2"X5 3/4" 4 3/4"X5 3/4" 5 1/2"X7" 6"X7" 6 3/8"X7"

Which, under still more definite translation produce these maximum horsepowers;

O-OX-K-L-G-TX-TXA-TXO

46HP 46HP 52HP 58HP 62HP 90HP 104HP 114HP

If your power requirements are within the range of Hercules—20 H. P. to 110 H. P.—we believe the experience of our engineering department can assist you.

We do not believe this because we hope it. We believe it because we can prove it.

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